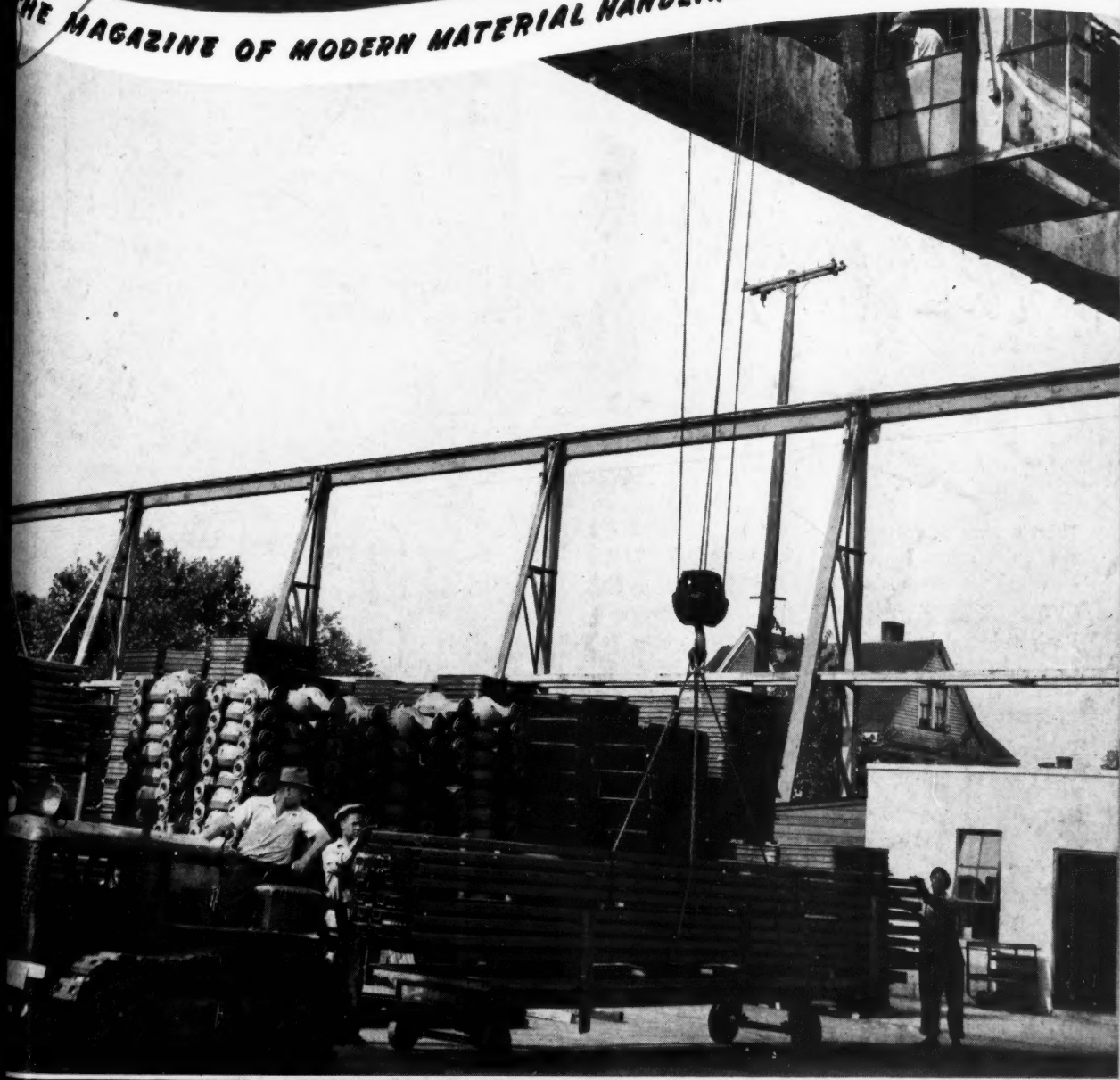


OCTOBER, 1949

# Flow

THE MAGAZINE OF MODERN MATERIAL HANDLING AND PACKAGING METHODS



**IN THIS ISSUE:** { **Craneway For Yard Receiving ... Keeping Erie Railroad Wheels Rolling ... Lower Shotgun Assembly Cost ... Welded Twin Package ... Idea Conveyor**



P&H



# Handle it "THRU-THE-AIR" Dependably!

✓R v.5 Oct. 1949 - Sept. 1950

There's only one Trav-Lift! P&H builds it! But it's available in capacities up to 15 tons — with various lifting speeds and spans — with floor or cage control. In short, your Trav-Lift is tailored to fit your specific needs.

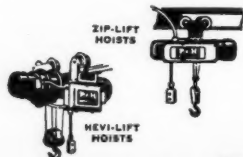
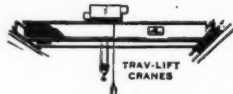
Designed and built with the same safety factors as a heavy-duty crane, standardized designs and lower costs make the Trav-Lift your best bet wherever service needs do not warrant investment in a heavy-duty crane.

Dependable? It's a product of P&H — America's leading builder of overhead materials handling equipment!

## Trav-Lift Capacities Run up to 15 Tons



See how the P&H Trav-Lift Crane can bring you new and broader economies in materials handling. Write for Bulletin H-13.



*These added values  
protect your investment*

**VARIABLE SPEED FULL MAGNETIC CONTROL** provides 5 distinct steps for all motions: controlled from pendant push-button or from operator's cab. **SAFE** — Only 110 volts at the push-button when floor-controlled. Start-stop main line contactor, disconnect switch, thermal overload protection, magnetic limit switch and powerful brakes assure maximum safety.

**ALL-WELDED BRIDGE AND TROLLEY** incorporates the most important factors in reliable service — rigidity, safety, accessibility.

**LIFE-TIME CONSTRUCTION** — Motors designed specifically for crane service — high starting torque, frequent reversal, etc. Shaved gears, grease sealed antifriction bearings throughout.

**COMPETENT ENGINEERING SERVICE** — P&H materials handling engineers will gladly give you their years of experience in working out your particular problems. Write us.

*Handle it "thru-the-air"  
at lower cost*



**TRAV-LIFT CRANES**  
4643 West National Avenue  
Milwaukee 14, Wisconsin

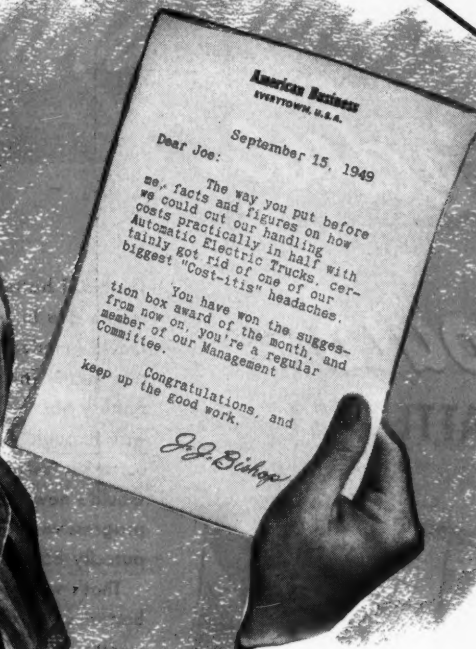
**HARNISCHFEGER CORPORATION**

HOISTS - WELDING ELECTRODES - MOTORS - EXCAVATING - ELECTRIC CRANES - ARC WELDING

*Teck*

FLOV

Did you ever get a letter like this  
from your boss?



NICE GOING, JOE!



## The pay-off for Joe...he showed the Boss how to cut handling costs in half!



Sure, with prices under pressure, sales declining, profits being squeezed, the boss is apt to say: "Lay low on capital expenditures."

But if you take him at his word, especially when it comes to handling costs, you're not doing him, the business or yourself any good.

Whatever your manual handling costs are now, deduct 50%, and you'll have the cost of handling your products with Automatic Electric Trucks. Imagine what relief that would give your boss from his "Cost-itis" headaches.

So get yourself all the facts about these amazing electric trucks and lay them before him. With effortless, easy finger-tip control, they lift, move and stack hundreds of pounds, or tons and tons of your material so easily, a stenog-

rapher could operate them in a breeze.

Yes, these mighty giants of electric power do all the work. One man accomplishes as much as three men doing fatiguing manual handling. The other two can be moved to more productive, better paying jobs.

Send the coupon today... and when you get all the figures, you can show your boss the thousands and thousands of dollars these electric trucks are saving industry every day, and how similar savings may be his!

You'll be rewarded for your interest... and you'll be the man he will keep his eye on for the better jobs that are always coming up. Mail the coupon now, and see how fast things start looking up for you!



TRADE **Automatic** MARK

141 W. 87th St., Dept. T-9, Chicago 20, Ill.

Please send me complete money-saving facts on amazing Automatic Electric Trucks, without obligation.

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By.....Position.....  
Street Address.....  
City.....Zone.....State.....



# Grid Porosity Reduced 85%

## IN NEW GOULD "Z" PLATE BATTERIES!

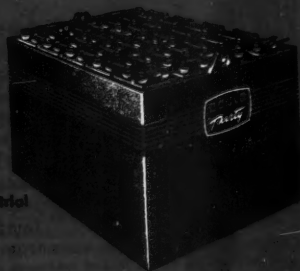


Cut-away view of "Z" Plate construction used in the  
Gould "Thirty" Battery

The No. 1 battery problem—positive grid failure due to porosity—has been solved by Gould's modern research laboratory and pilot plant! The new Gould "Z" Plate Battery has the only grid that is solid all the way through. Accelerated laboratory corrosion tests prove beyond question that Gould's new casting technique of progressive solidification can reduce porosity 85% to 90%!

That's why the new Gould "Z" Plate Batteries stay new longer . . . give more months of full capacity service. Only Gould offers you so much for your battery dollar, because only Gould has the new "Z" Plate!

Save money by replacing your old batteries new with new Gould "Z" Plate Batteries. Let us submit a quotation. And write us for literature on the new "Z" Plate Battery, greatest battery advance in years!



The Gould "Thirty"—  
More than ever,  
America's Finest Industrial  
Truck Battery

# GOULD

STORAGE BATTERY  
CORPORATION

TRENTON 7, NEW JERSEY

Always Use Gould Automobile and Truck Batteries



# Flow

VOL. 5, NO. 1 • OCTOBER, 1949

IRVING B. HEXTER, Pres.  
LESTER P. AURBACH, V. Pres.

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AND AIR CONDITIONING



## CONTENTS

COVER PHOTO—Excellent coordination is shown between overhead and on-the-floor equipment in this view taken at Cleveland's White Motor Co. From the centrally located craneway the crawler-mounted tractor regularly hauls a large volume of components to nearby shops. See full report on page 22.

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Single copy price—30 cents.

"Acceptance under section 34.64, P. L. and R. authorized at Milwaukee, Wisconsin."

# Keeping the Navy "Ship Shape" with the Dempster-Dumpster . .



Shipyards, stations, and the men in Uncle Sam's Navy set a standard of cleanliness that is unsurpassed. Helping to maintain this high standard of Navy cleanliness is the Dempster-Dumpster System of materials handling . . . a system of quick pick-up of preloaded containers for hauling, dumping or moving materials.

Exactly 10 years ago the Navy purchased its first Dempster-Dumpster equipment . . . one truck hoisting unit with several containers. Now there are dozens of hoisting units and thousands of Dempster-Dumpster containers of many types at work keeping Navy yards and stations "ship shape." The sturdy steel foolproof and fireproof containers are placed at various places, such as barracks, mess

halls, the docks and ship yards, wherever materials (solids or liquids) need be deposited immediately as they accumulate. A Dempster-Dumpster truck hoisting unit quickly picks-up each container when it is filled and hauls it to the disposal area. Contents are automatically dumped and container returned.

If you have a materials handling problem demanding more cleanliness, more economy, and more efficiency, it will pay you to investigate the Dempster-Dumpster System—popularly used, not only by the armed forces, but by municipalities, leading industrial plants, and by large and small institutions of all kinds.

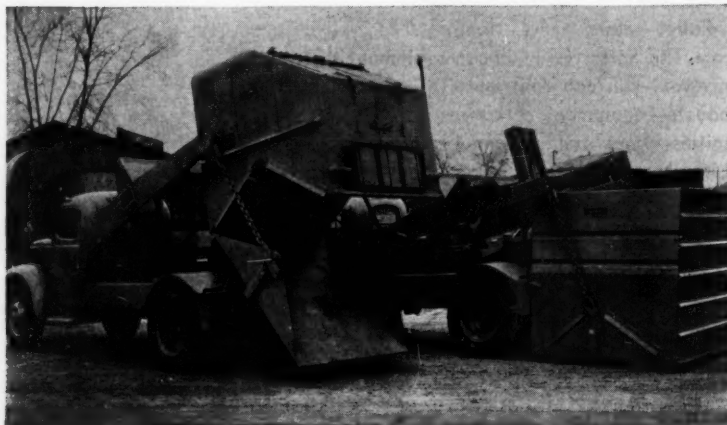


Photo above shows eleven hoisting units recently delivered to the U. S. Navy. Various types of containers are shown in carrying positions. Photo at left shows a hoisting unit preparing to lift a 10 cu. yd. Flat Top container, while another hoisting unit is dumping a 9 cu. yd. Trash and Rubbish Kollector type container. All controls of unit are conveniently located at the driver's seat. One driver and one truck handles any number of containers regardless of types.



8109 N. Knox  
Knoxville 17, Tennessee

OCTOBER, 1949 • FLOW

2



▲ These tangled lines mean waste! Light bulb attached to the man's wrist gives you the actual camera's record. Figure the time—the effort—the cost . . . wasted!



Compare it with the Barrett way—where big steel loads move on a well-oiled, efficient man's motion . . . at a fraction of the cost.



**stop!**

**this waste motion  
NOW!**

**BARRETT  
LIFT-TRUCKS and SKIDS  
are the Low-Cost way!**

Why pay for more costly, elaborate equipment when Barrett Lift-trucks and Skids provide the basic answer to your handling requirements? Actually, the big cost factor to eliminate is the repeated loading and unloading . . . piling and unpiling.

You end all this with the thrifty Barrett System. Then, from room to room, floor to floor, in and out of storage . . . loads *stay* on the skids, always ready to roll with a sweep of the Lift-truck handle. It's quicker, easier and far more practical. And best of all . . . *one man does the work of three or four!*

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Send for your free copy of the Barrett Junior Catalog.

**BARRETT**  
ONE MAN DOES MORE THAN 3 OR 4, . . . WITH A BARRETT

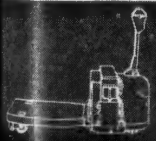


PORTABLE ELEVATORS



STEEL STORAGE RACKS

**Barrett  
Handling  
Equipment**





**Fast—Low Cost Handling—with**

**LINK-BELT  
SPEEDER**

**FAST POWERFUL  
TRUCK CRANE**



**CRAWLER CRANE  
WITH MAGNET**



**MOBILE AND  
MANEUVERABLE  
UC55**



## *Shovel-Cranes*

**CARGOCRANE**



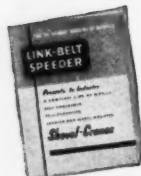
**IN THE BROAD LINK-BELT SPEEDER  
LINE THERE IS A TYPE AND SIZE  
BEST SUITED TO YOUR NEEDS**

Loose or bulk material, steel and lumber, or product parts in assembly—you can handle any or all of them efficiently and economically with Link-Belt Speeders.

Highly maneuverable, wheel-mounted types, range from the YC-9 Cargocrane, with a lifting capacity up to 10 tons, to the HC-90 Truck crane, with a capacity of 25 tons, and boom lengths of 100 feet plus jib. Crawler machines are useful in limited working areas.

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11,012



This book is full of illustrations and valuable suggestions on materials handling with Link-Belt Speeders. Send for a copy — NOW. Book No. 2503.

# LINK-BELT SPEEDER

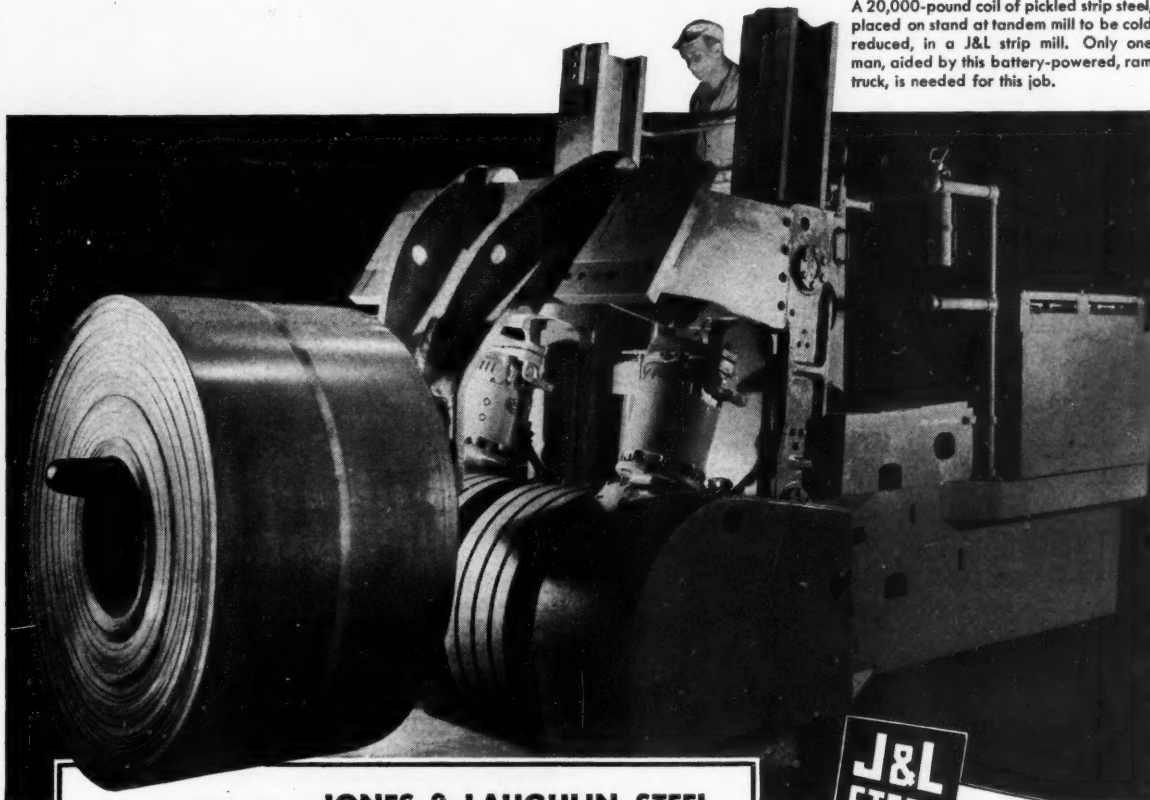


LINK-BELT SPEEDER CORPORATION,  
CEDAR RAPIDS, IOWA

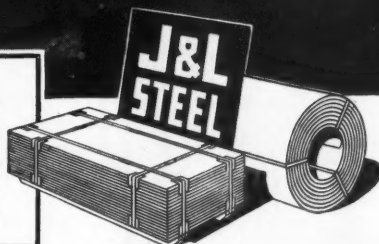
Builders of the Most Complete Line of  
**SHOVELS—CRANES—DRAGLINES**

# 27¢ per truck-hour covers all powering costs for these 15-ton electric trucks

A 20,000-pound coil of pickled strip steel, placed on stand at tandem mill to be cold reduced, in a J&L strip mill. Only one man, aided by this battery-powered, ram truck, is needed for this job.



**JONES & LAUGHLIN STEEL CORPORATION FINDS BATTERY-POWERED INDUSTRIAL TRUCKS GIVE LOW-COST DEPENDABILITY, AROUND THE CLOCK**



At its Second Avenue plant, Pittsburgh, Pennsylvania, J&L uses sixteen battery-powered ram and fork trucks to lift, move and place great coils of strip steel or "flats" of sheet and plate weighing up to 30,000 lbs. Introduction of electric trucks assured orderly, dependable transfer, on a 20-hour schedule, of material through the various operations such as hot strip rolling to annealing and pickling, pickling to cold rolling, with han-

dling service for temporary storage between operations.

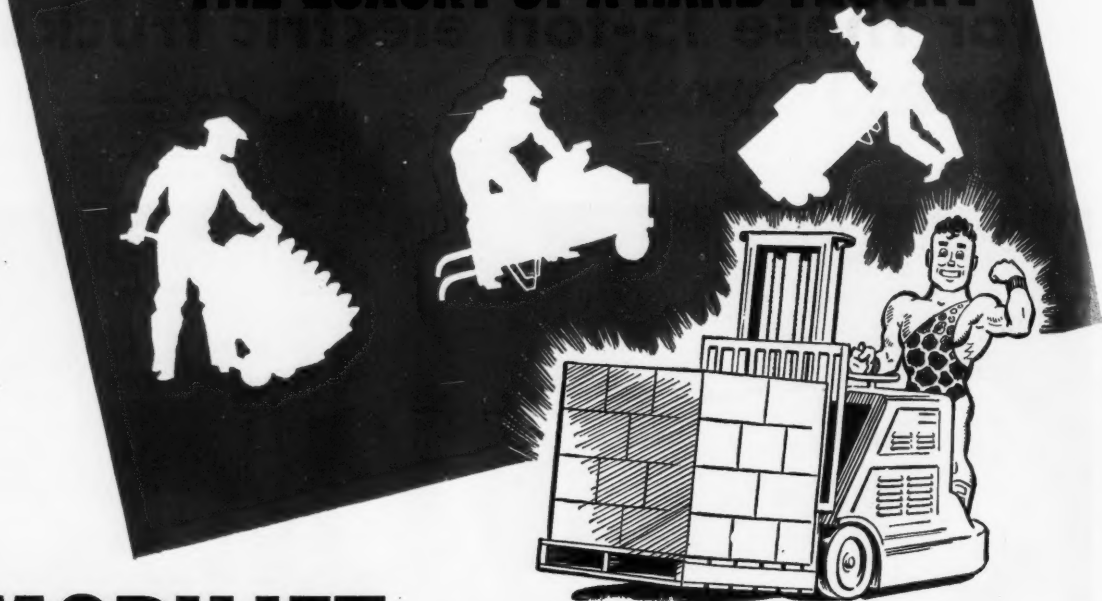
J&L accrues, in a special reserve account, all charges for power metered to the charging station, all labor and equipment for servicing and charging batteries, all battery replacements. Such accruals have been 27 cents at most, per truck-hour. This reserve has always been adequate to cover all cost of powering the trucks.

Another example of why cost-probing management looks at the cost per unit moved, rather than initial investment, in determining its purchase of handling equipment. And another reason why, more and more, "America's Top Industries Prefer Battery-Powered Trucks!"

**THE ELECTRIC INDUSTRIAL TRUCK ASSOCIATION**

3701-L NORTH BROAD STREET • PHILADELPHIA 40, PA.

*Can you afford*  
**THE LUXURY OF A HAND TRUCK?**



## **MOBILIFT** Saves on every load

It is surprising how many well-equipped modern plants still cling to wasteful hand truck methods for moving materials. Every year hundreds of these plants become "Mobilized"—always with the same result. When Mobilift goes to work executives are amazed at the permanent economies which show up.

- Mobilift saves hours of back-breaking labor
- Mobilift increases available storage space
- Mobilift reduces accidents to personnel
- Mobilift reduces damage to materials
- Mobilift eliminates needless rehandling

With such savings the cost of replacing hand trucks with Mobilifts pays off in a very short time. Check up on your operation now. Let a Mobilift expert show you how Mobilift can bring new efficiency and tremendous economy to your handling operations. Write us today for illustrated literature on Mobilift operations.



### **MOBILIFT CORPORATION**

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Please send me your illustrated folder on Mobilift operation.

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City \_\_\_\_\_ State \_\_\_\_\_



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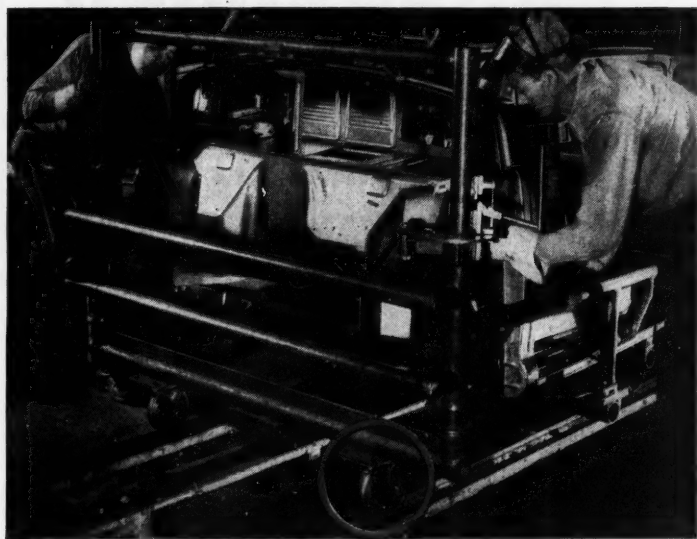
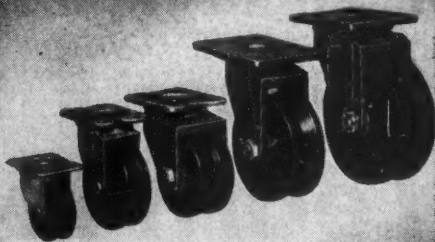
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CHICAGO

BERKELEY  
LOS ANGELES

ATLANTA  
DALLAS



# Studebakers start to roll on **BASSICK** GROOVED- WHEEL **CASTERS**



Assembly fixtures at Studebaker roll easily—with controlled movement and secure positioning where wanted—on Bassick Grooved-Wheel Casters, operating on angle-iron floor track.

It's the simplified  
assembly line that  
**SAVES TIME,  
SPACE, MONEY**

Save production and handling costs by moving assemblies and equipment on Bassick Grooved-Wheel Casters.

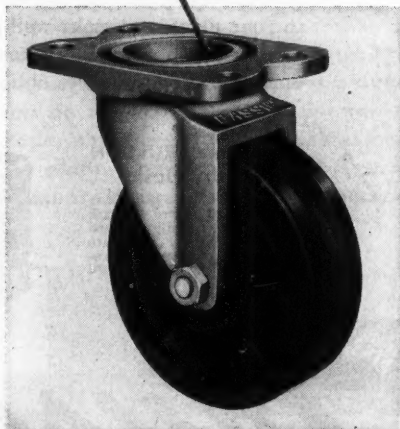
Angle-iron floor track is cheap and easy to install . . . the track is self-cleaning . . . and changes in layout can be made at any time and inexpensively.

The Grooved-Wheel Casters roll easily . . . with less mechanical or man-power . . . and operate on the floor as well as on the track.

Wide range of sizes from 4 in. to 10 in. . . to carry light loads or weights up to 10,000 lb. per caster.

Bassick Grooved-Wheel Casters save money for The Studebaker Corporation — is there a spot in *your* business where easier handling would save *you* money? Write to THE BASSICK COMPANY, Bridgeport 2, Conn. DIVISION OF STEWART-WARNER CORPORATION. In Canada: BASSICK DIVISION, Stewart-Warner-Alomite Corporation, Ltd., Belleville, Ontario.

**Sold by Leading Industrial Distributors**



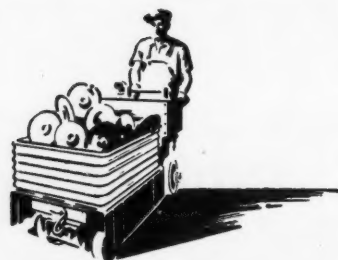
Why not write  
us now  
for bulletins  
with facts  
On Bassick Grooved-  
Wheel Casters  
For angle-iron  
floor tracks



# Bassick

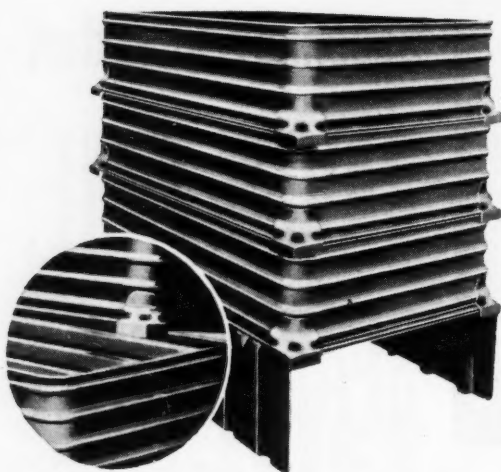
Making more kinds  
of Casters . . .  
Making Casters  
do more

# Learn to say



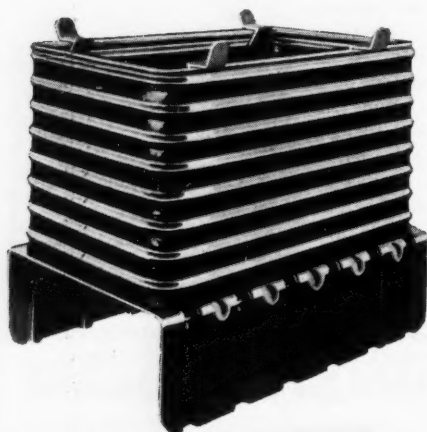
## TRUSCONVEY

**WHEN YOU WANT EFFICIENT  
MOVEMENT AND DELIVERY  
OF MATERIAL!**



### Removable Box Units with Corner Stacking Brackets

Boxes can be stacked on platforms to any practical height. Sections are easily removed and material is always within a few inches of the top. Corner stacking brackets which fit over the corner of the platform or box are securely welded to the bottom corners of each box section and are designed to permit rapid and secure assembly.



### Box and Platform Units with Tiering Lugs

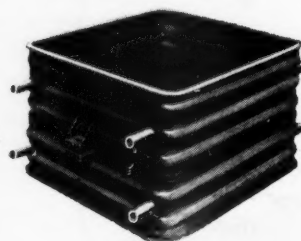
Truscon units provided with tiering lugs securely welded to the top of each box, as illustrated, give greater box capacity because boxes can be the full width of the platform. Standard units, with or without channel runner, are available.



### Investigate TRUSCON Foundry Flasks

Light weight . . . durability . . . strength where strength is needed . . . easily rammed and shaken out . . . these are features of economy and production you get in TRUSCON foundry flasks.

Write for descriptive literature on complete line.



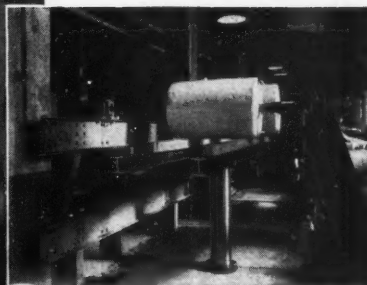
# Truscon

### MATERIALS HANDLING EQUIPMENT

Truscon Steel Co., Pressed Steel Division, 6100 Truscon Avenue, Cleveland, Ohio. Subsidiary of Republic Steel Corporation.

**YOU'LL FIND IT WILL PAY TO TRUSCONVEY YOUR PLANT MATERIALS**

# SAFER, QUICKER, EASIER MATERIAL HANDLING



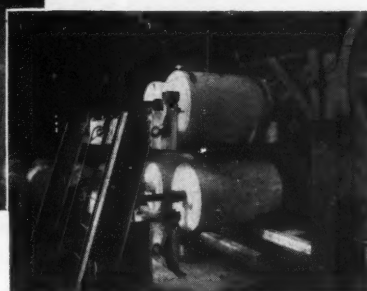
Wayne Lift in Newspaper Plant



Tilting Loading Dock Ramps



Single Post Platform Hoist



Easy to Handle Heavy Rolls

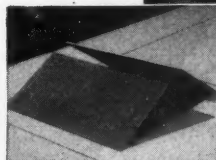
## Cut Handling Costs

### INCREASE PRODUCTION WITH WAYNE INDUSTRIAL HOISTS

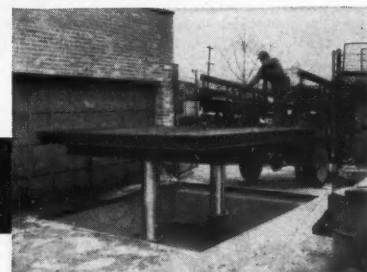
"BETTER MATERIAL handling offers industry its biggest opportunity to cut production costs and to increase productivity," says Factory Management and Maintenance, which devoted forty-seven pages in January to this subject. Investigate what it can do for you. Let Wayne engineers help you design the proper equipment to assure better handling of material in your plant. There's a Wayne Hydraulic Hoist for every requirement. Write for more information.



Wayne Lift Sidewalk Type



Two Post Platform Hoist



**MAIL Now!**

**WAYNE**  
NATIONWIDE  
SERVICE

THE WAYNE PUMP COMPANY • FORT WAYNE 4, INDIANA  
516 TECUMSEH STREET

Please send folder and other information on Wayne Industrial Hoists. I am interested in \_\_\_\_\_.

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CITY \_\_\_\_\_ STATE \_\_\_\_\_

HOSE REELS • POWER WASHERS • BULK PUMPS



# 20%

## ADDITIONAL K.W.H. CAPACITY



Catalog IT-515  
Available  
On Request

*-at NO extra cost!*

**C & D BATTERIES, INC.**

TELEPHONE • DIESEL • ELECTRIC INDUSTRIAL TRUCK • LOCOMOTIVE • STARTING & LIGHTING  
*Established 1906* **of Conshohocken, Pa.** SALES AND SERVICE  
IN PRINCIPAL CITIES

There's Much in the Offing as . . .

# Flow Starts Its Fifth Year

**W**ITH this issue FLOW enters its fifth year. There is a dramatic wallop for us in these few words, because in the past four years we have seen an industry come of age. When the first issue of FLOW made its appearance in October 1945, some people asked us: "What will you put in your second issue?"

In these four years we have seen three material handling expositions take place, and now the Material Handling Exposition is recognized as the third largest industrial show in the country. We have seen a nebulous trade association develop into the Material Handling Institute, which is a well-run, well-financed group of companies and individuals with a very definite and constructive program.

These four years have seen American industry agree that the science of material handling is one of the most important management functions in the conduct of today's business. We have seen an important engineering group form itself into a vital and enthusiastic society for the interchange of engineering data and the best methods of meeting handling problems.

Yes, these have been an exciting, challenging—and gratifying—four years. FLOW is proud to have been around during this period. If we've contributed to the general progress—and we hope we have—we're glad.

And where do we go from here? We are going into fields not now even thought of. We will continue to consolidate the gains already made. We will continue to educate industry to the profit possibilities of engineered material handling methods. This is a worth-while goal which must be achieved, and will be. For we know that a sore spot in industry today is "hidden costs"—costs that are conveniently lumped together as "general overhead" or "general manufacturing cost."

Some day these will be broken down and the revealing light of day will show some sorry inefficiencies.

This area alone offers a tremendous scope for the future growth of the material handling industry. And scientific and technological advances give promise of further developments which no one can even attempt to predict today.

Yes, we in the material handling industry have much to look forward to.

*Irving B. Hexter*

Publisher

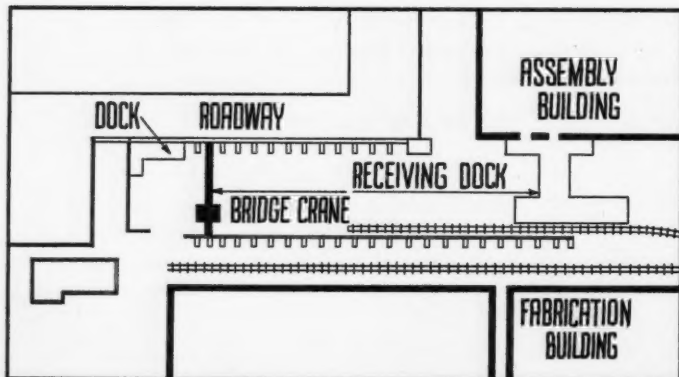


**ELECTRIC BRIDGE CRANE,  
CRAWLER-MOUNTED  
TRACTOR, RUBBER-TIRED  
TRUCKS, CORRUGATED  
STEEL SKIDS.**

◀ **BRIDGE CRANE** moves lift of side rails from stockpile to carrier which will deliver to assembly plant.

Factors to consider when you plan . . . .

## A Craneway for Yard Receiving Storage Disbursement



Specific considerations relate to (a) optimum location of the craneway and crane capacity, (b) the right handling tools for the various sizes and weights of materials received, (c) stock arrangement and selection procedures, (d) dispatch in serving production and (e) advantageous applications of auxiliary equipment. The location of the craneway is not only important from the standpoint of proximity to production, but it should also allow for future expansion. In cases where future growth has not received adequate attention in the planning stage, the penalty has been a costly relocation later.

**Y**ARD handling is often a phase of in-plant handling. This is the case where (a) materials lend themselves to outside storage and (b) where, for reasons of space economy, storage within buildings can be maintained only for daily requirements. In such cases, yard receiving and storage becomes an extension of normal plant operations, with machining and fabricating relying on the outside function to take care of all supply operations to the plant.

Such yard installations are planned to serve production with the least travel and effort. A crane-

◀ **CRANEWAY** is shown with truck roadway, railroad spur and "T" dock, including shop buildings.



way, for example, will be laid out for the shortest moves possible of materials to destination, and accessory on-the-ground equipment will be integrated to maintain a smooth material flow. Specific considerations in this respect are listed in the introductory paragraph.

#### Central Location for All Needs

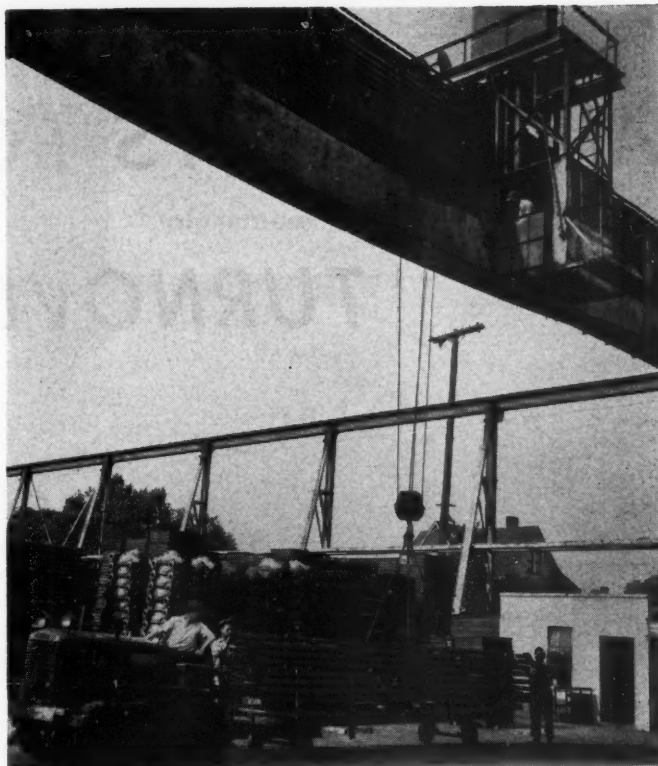
An example of a well coordinated yard receiving and storage operation is at The White Motor Company, Cleveland, one of the largest manufacturers of heavy-duty trucks which are built to customers' specifications. On the company's 44-acre plant site the receiving-storage yard is laid out centrally in relation to the buildings serving for chassis assembly and miscellaneous machining operations.

The crane runway, 480 ft. long, extends in an area that is located in the center of these buildings in an east-to-west direction. It can be seen from the flow sheet that access is provided to the street for truck deliveries at one side, to a rail spur that enters the yard at the other side, and a partially roofed T-dock at the north end of the layout. Thus full advantage can be taken of all transportation facilities. At the same time all materials, whether arriving by rail car or highway truck, can be delivered to the various shops with minimum travel because of the central location.

The double girder bridge crane serving the yard has a 100 ft. span, a traveling cab, and is of 5-ton capacity. (Auxiliary equipment for the lighter lifts is described later.) The traveling cab on the wide span of the crane is of special value; it enables the crane operator to move close to the area of operation and see the lifts at any desired angle.

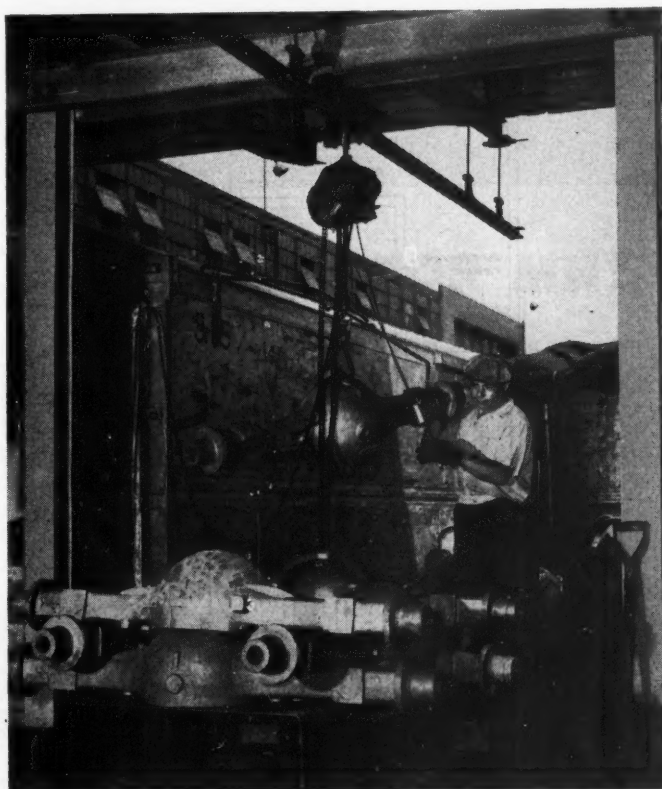
The materials handled in the storage yard and on the T-dock are of many shapes and sizes. The bulk of receipts consists of chassis side rails, front and rear axles, both bundled into load units, as well as bundles of bar stock and tubing. The side rails, which usually arrive in gondola cars, come up to 25 ft. in

(Turn to page 34)



▲ LIFT OF components being placed on frame truck, which crawler-mounted tractor will haul to shop. Note neat stacks of axle housings in background.

▼ ONE-TON ELECTRIC hoist unloading lighter components from delivery vehicle at north end of T-dock. Hoists handle all lighter receipts at this truck dock.



# AIR CIRCUITS FOR TURNOVER STACKER

By **W. J. SCHUPNER**  
Design Engineer  
Chicago, Ill.

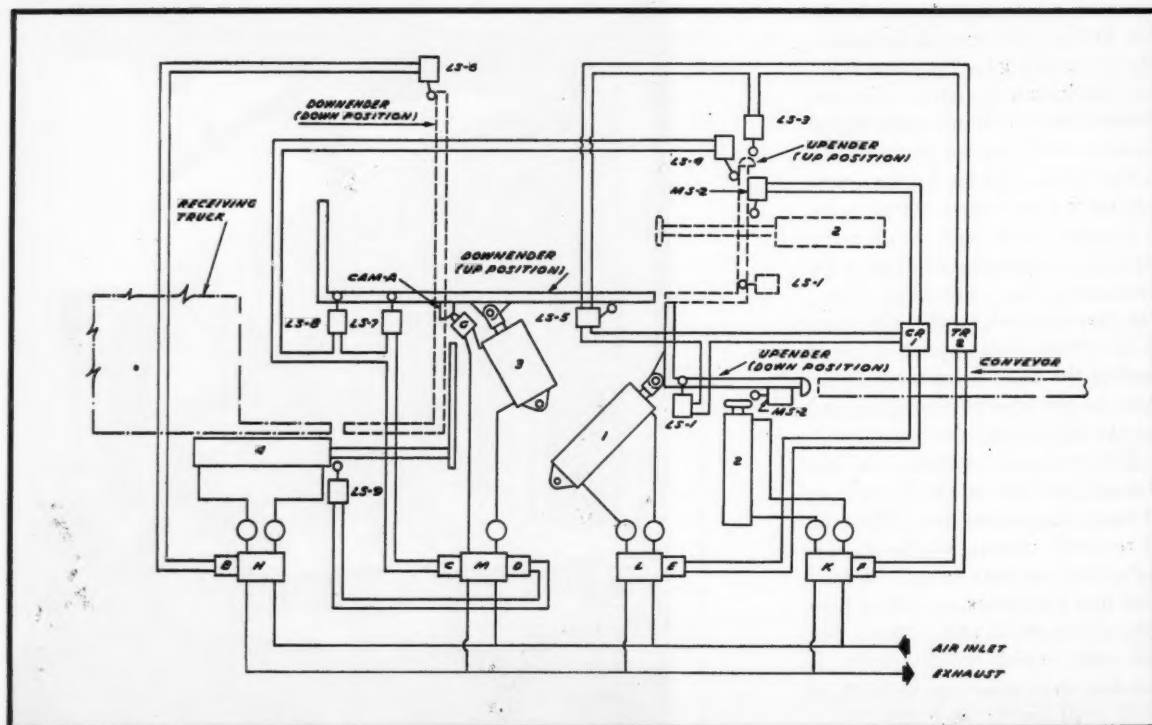
THE versatility of air controlled equipment is well demonstrated by the "Turnover Stacker," a unit designed as part of the conveyor system in a pulp mill. The function of this unit is to receive single bales of pulp from a power conveyor, turn them over in a stack six bales high, then discharge the stack to a receiving truck. The air circuit employed to accomplish this is based on certain safety features

which prevent any part of the machine from operating except in its proper sequence.

The general arrangement of the unit is shown schematically in Fig. 1 and the various steps of its operation will be described in turn.

A bale of pulp is deposited by the power conveyor on the "upender," shown in heavy lines in the "down" position. The bale contacts normally open limit switch LS-1 which

Fig. 1. Air circuit for turnover stacker in the conveyor system of a pulp mill.



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is connected in series with LS-5, a double contact limit switch, also normally open and held closed by the "downender" as shown in its "up" position. LS-1, held close by the bale, closes a magnetic contactor or relay CR-1, which, in turn, energizes solenoid "E" on the four-way spring return valve "L." Valve "L" directs air to cylinder No. 1 which pushes the upender upward to the position shown in dotted lines.

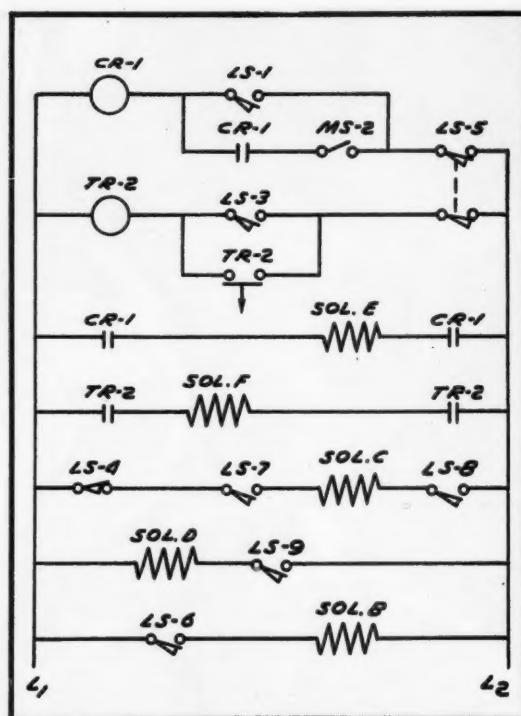
As the upender reaches the "up" position, a dog attached to it trips and bypasses LS-3, a normally open limit switch operative in one direction only, which is also connected in series with LS-5. LS-3 upon closing, energizes the coil which closes TR-2, a normally open time delay relay, the action of which is retarded to reopen after fifteen seconds.

TR-2 functions to energize solenoid "F" on the four-way spring return valve "K," which directs air pressure to cylinder No. 2. Note that cylinder No. 2 is attached to the upender and travels with it. As the piston of cylinder No. 2 starts forward, a dog on the end of the rod trips and bypasses MS-2, a maintained contact switch which closes as it is tripped, thus maintaining the holding circuit in CR-1. At this point CR-1 keeps solenoid "E" energized since LS-1 opens immediately after MS-2 closes. The bale is pushed onto the downender, shown in heavy lines in the "up" position.

At the end of the fifteen second setting of the time delay relay TR-2, it opens, thus de-energizing solenoid "F" on valve "K" which reverses cylinder No. 2; the dog on the end of the piston rod opens MS-2, thus breaking the holding circuit in CR-1 which, in turn, de-energizes solenoid "E" on valve "L" and reverses cylinder No. 1. The upender has now returned to its original "down" position.

These operations are repeated until six bales have been pushed onto the downender. As the sixth bale goes into position, the first and second bales close LS-7 and LS-8.

Fig. 2. Line diagram of the electrical pilot circuit.



These two limit switches are attached to the downender (Figure 1). These switches are normally open and are connected in series with LS-4, a normally closed limit switch held open by the upender in the "up" position. Therefore, as the upender moves down at this phase of the cycle, LS-4 closes to start the operation of the downender.

When LS-4, LS-7 and LS-8 are all closed, solenoid "C" on the double solenoid four-way valve "M" is energized and cylinder No. 3 starts to move the downender with its six bales into final position. However, it is apparent that as the center of gravity of the load, which is being pushed by cylinder No. 3, passes over the pivot point of the downender, it comes under the pull of gravity and would normally tend to "run away." To prevent this, a cam operated valve "G" is placed between the rod side of cylinder No. 3 and the four-way valve "M." Valve "G" has free flow in the direction of the cylinder and controlled restricted flow toward the valve.

A cam "A," attached at the pivot

point of the downender, is timed to properly restrict the exhaust air from the cylinder through valve "G." This cushions the load slowly to its "down" position as shown in dotted lines. Note that the downender opens LS-5 on moving away from it, thus cutting out upender operations.

As the six bales reach their final upright position, LS-6 closes, thus energizing solenoid "B" on spring return four-way valve "N" and causing stackpuller cylinder No. 4 to pull the stack of six bales onto the receiving truck. As the bales leave the downender, LS-7 and LS-8 open, deenergizing solenoid "C" on valve "M." The valve spool does not change position; however, since this valve is operated by momentary contact and air still remains on the lower side of cylinder No. 3. Upon reaching the end of its pull stroke, a dog attached to the end of the rod of cylinder No. 4 trips and closes normally open limit switch LS-9, energizing solenoid "D" of valve "M," reversing it and causing cylinder No. 3 to pull the downender to its original "up" position.

As the downender draws away

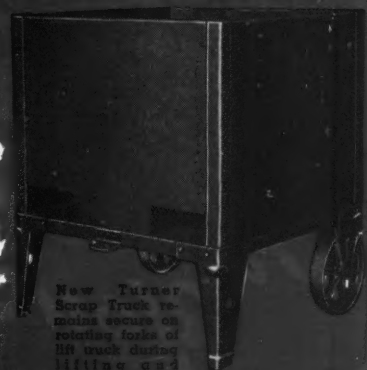
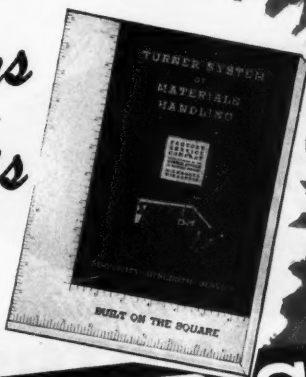


The Transport (G type) is half-truck, half-platform and does the work of both at a substantial saving. Bin Sections, Pallets, Die Racks, Shelves or Superstructures are quickly movable on the Transport (see below).



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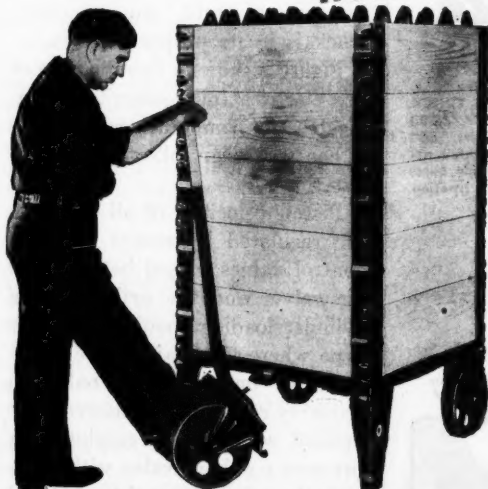
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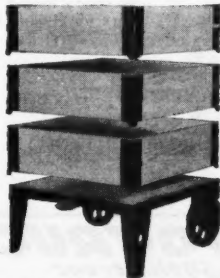
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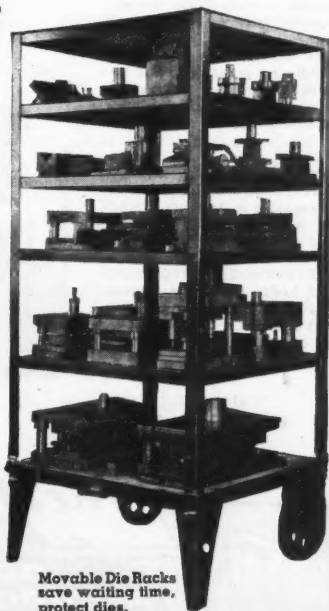


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from LS-6, the circuit to solenoid "B" is broken and cylinder No. 4 returns to its starting position. Sufficient clearance is maintained between the receiving truck and the downender to enable the latter to return without interference. The main electrical lines to the pilot circuit of the turnover stacker are connected in series to a master switch (not shown), a precaution observed to render the entire unit inoperative until the receiving truck is in its proper position.

Figure 2 shows a line diagram of the electrical pilot circuit and indicates the comparative simplicity of control design followed throughout the unit.

Piston velocities of all cylinders are regulated by means of speed control valves placed between the air valves and the cylinders. In cylinder loading conditions of this type where the major force is exerted in one direction only, an economy measure to conserve compressed air is often employed; a pressure regulator valve with a bypass check is connected to that end of the cylinder requiring only low pressure to operate it. In cylinders having a long stroke and large diameter the resultant saving in compressor power over a long period of operation may be considerable.



## MEN IN THE NEWS

**E.** R. TRAXLER has been named manager of the new flat belting field engineering and development department of the B. F. Goodrich Rubber Co., according to R. D. Hager, general superintendent of the industrial products division. Traxler has been with the company since 1935, all his career having been spent in product development.

**R**OBERT H. DAVIES has joined the Baker-Raulang Co. as manager of engineering. He will have supervision of all engineering functions for the company. Davies formerly was associated with the Lockheed Aircraft Corp., Northrop Aircraft, Inc., Henry J. Kaiser Co. and for the past 5½ years he has been with the Lincoln Electric Co.

**G**ILBERT W. CHAPMAN has been elected president of The Yale & Towne Mfg. Co. by the board of directors, it was announced by Joseph A. Horne, chairman. Chapman, who has been serving as vice president in charge of finance, succeeds Calvert Carey as the sixth president of the 81-year-old lock and material handling equipment company. Carey resigned because of ill health. Fred Dunning will continue as executive vice president and Otto G. Schwenk will also continue as vice president in charge of production. Chapman had been president of the American Water Works Co. before joining Yale & Towne, in June, 1948, as vice president. Last November, he became a member of the board of directors.



Gilbert W. Chapman

**V**INCENT IDZIAK, production manager and chief engineer of Brummeler Steel Products Corp., has been elected vice president. He has been in charge of all production and development of the Brusco line of material handling equipment since the close of the war. He will continue as chief engineer in charge of new products and will supervise design and engineering of special handling equipment.

**M**ERRILL BROS. announced the appointment of Howard L. Franks as director of sales for the company. Franks was previously sales manager of the Charles Fischer Spring Co., and prior to this he was with the Carpenter Steel Co.



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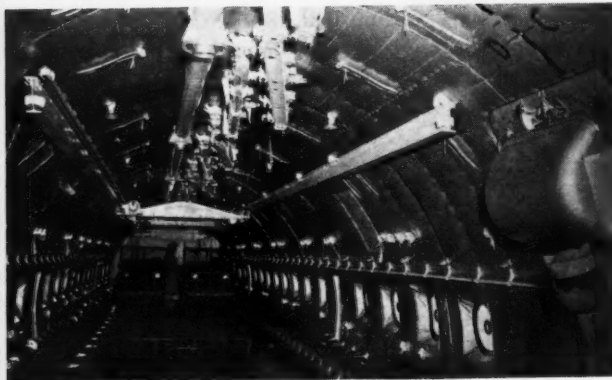
# MATERIAL HANDLING in the AIR AGE

## PART I

Handling procedures of commercial air freight carriers must be designed to keep the cost per ton mile on a competitive level by reducing on-the-ground time of aircraft to an absolute minimum. This depends largely on the operational procedures developed in conjunction with efficient handling equipment. This introductory article (the first of two) reviews the latest adaptations of material handling machines to aircraft design.



CARGO ELEVATOR shown lifting vehicle aboard Globemaster. Lifting is done by the cranes, shown below.

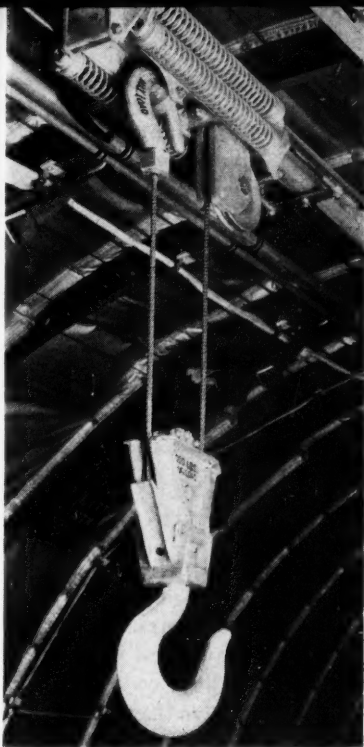


LIGHT ALLOY twin bridge crane and detachable floor make up cargo elevator in Globemaster.

THE Berlin air lift dramatically demonstrated the feasibility of the mass movement of supplies by air. It has dwarfed any previous conception of the possibilities of air freight. The reader will recall that the allied air lift carried all supplies needed to feed, house and keep comfortable a population of 2,500,000. The success of this gigantic project has in turn pointed up the possibilities of air freight for commercial and industrial shipments. In the European air lift operation there was no opportunity for the adoption of mechanized material handling techniques; the need was urgent and German labor was plentiful.

Reviewed on these pages are several categories of material handling equipment of the overhead type, which have been incorporated in the basic airframe design. These examples are among the first instances where handling facilities have definitely influenced the final design of transport aircraft. (A companion article in an early issue will feature other handling innovations now in an advanced stage of development.)

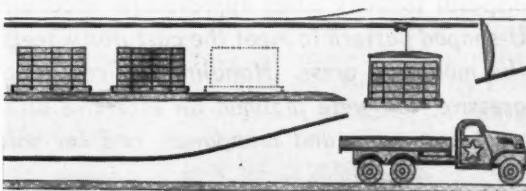
Airplane manufacturers well realize that the long-term objective



**CARGO HOOK** detail showing method of suspension as used in the Boeing Stratofreighter.



**PALLET LOAD** goes aboard by cargo hook. In sketch, below, load is hoisted from a truck.



**DETAIL OF** box-type crane, shown centrally in fuselage. It travels on underside of wings.



**BULKY LIFT** is hoisted aboard Martin Mars flying boat by crane. Note tracks under wing.

of fast efficient handling must come by way of (a) cargo aircraft of economical capacity, (b) modern material handling systems adapted to the design of the craft, and (c) efficient packaging of commodities for commercial users.

The air freight trend is clear from the following figures released by a major airline company. The volume increased from about 1,500,000 freight ton miles flown in 1945 to approximately 41,000,000 in 1947. The figures for 1948 are expected to reach 75,000,000 freight ton miles.

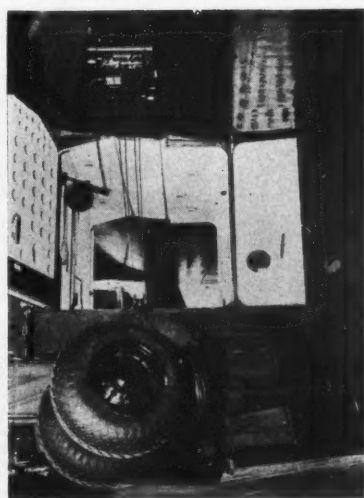
While the handling facilities presented here are the latest operational types to date, the reader should bear in mind that technological and design changes in aircraft are constantly being made. Handling procedures and equipment are therefore bound to be modified at an equally fast rate as dictated by research and experience in economical air freight movement.

#### Powered Cargo Hook

The Boeing Stratofreighter, a transport design based on the familiar Superfortress, incorporates an electrically powered cargo hook

operating on a monorail extending the full length of the upper cargo fuselage. This equipment is controlled from a remote pendant switch box. The unloading and loading point is located at the rear end of the fuselage and is protected in flight by two large doors under the tail assembly. Loading ramps, highway truck bodies and high-lift fork trucks (with palletized loads) are accommodated through these doors. The lift is hoisted aboard by the motor-driven hook and swung forward along the overhead rail to the desired point. Lifts can be made from the ground or from

(Turn to page 32)





# HOW THE



# KEEPS THE WHEELS ROLLING

## PART II

*Continuing the description begun in Part One: beyond the scrap disposal stations, axles approved for reconditioning advance in a U-shaped pattern to meet the cast iron wheels for assembly before the mounting press. Handling devices integrated into the progressive flow were planned for effective utilization of floor area and manpower, and for safety.*

AS WAS indicated last month in Part One of this article, this concluding part on the Erie Wheel Shop covers a typical flow pattern through the plant. The flow sheet shows a triangular structure, which results from the fact that this shop has been converted from a quarter section of a former roundhouse. The machinery is placed radially to compensate for the arc.

The flow of axles (for cast iron

By **C. A. KOTHE**

Shop Superintendent

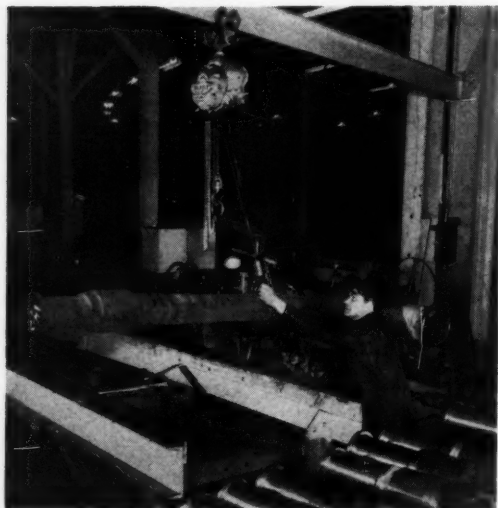
Erie Railroad, Meadville, Pa.

wheels) is U-shaped along three walls, and it constitutes the chief interest of this description. Unmounted steel wheels, which are handled in the reconditioning line along with east wall only, will be touched on in passing.

### Hoist Distributes Axles and Wheels

The electric hoist serving the "incoming" production aisle takes the axle with the pressed off wheels from the demounting press, then lowers one wheel alternately on a two-wheel hand truck. These wheels (approved for reconditioning) are moved a few feet to storage stacks laid out to be handy to the boring mills. The wheels are stored on edge, which facilitates disposal and pickup by the two-wheel hand trucks. These load carriers have specially long handles, which give extra leverage. A long center leg, bolted to the frame, was likewise designed for easy operation.

With the wheels disposed of, the hoist carries the axle east (bypassing the scrap disposal stations described in last month's article). The units approved for reconditioning are deposited on Rack No. 1, which serves for cleaning and magnetic inspection for hidden flaws. This rack, about 30 ft. long, terminates at a turntable at the east wall. This turntable routes the inspected axles to gravity Rack No. 2, which has two decks. Approved axles are shunted to the top



HOIST on jib covers supply rack, right, the lathe, finish rack, which extends into back.



**TWO-WHEEL TRUCK** moves wheels short distance to boring mill, adjacent to assembly.



**FORK TRUCK** handles new wheels four at a time. Note the notches, also the clamp.



**FORK TRUCK** also handles rejected axles from lower deck of gravity rack to stockpile.

deck, rejects to the lower level. Here is how this operation is performed by means of a pneumatically operated elevator section.

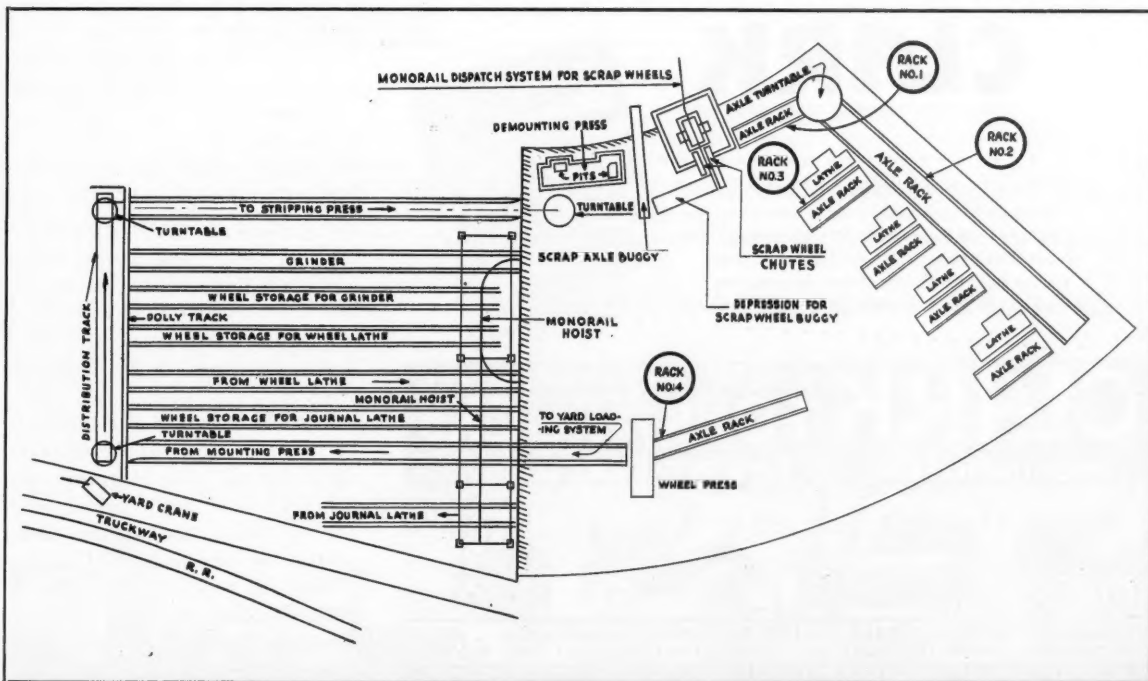
The cleaned and centered axle rolls to a hinged stop at the end of Rack 1, where the magnetic test is performed. A foot-operated trip releases the stop and the okayed axle rolls ahead on the tilting track on the turntable. The journal of

the advancing axle trips a pneumatic switch, which rotates the table 90 degrees after a five-second time delay. The rail section now tilts, discharging the axle on gravity Rack No. 2, whereupon the turntable swings back automatically to receive the next axle. The discharged axle (without a flaw) rolls ahead on the upper tier of the gravity track, which supplies a

battery of lathes that are located at right angles to this line.

Here is what happens in the event the magnetic test shows an axle to be defective. The inspector presses the button of an electric switch. This releases two hinged steel plates, which drop down below track travel. The permanent track on the elevator, about 12 ins. long, is a concave section. As the

**IN WHEEL SHOP**, right, cast iron wheels flow in "U"-pattern indicated by numbered racks. Storage yard layout, left, is reproduced from Part I, September issue.

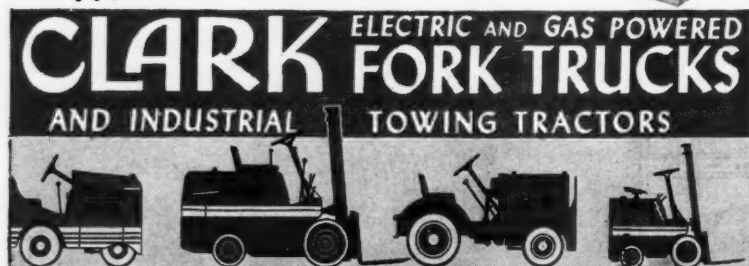
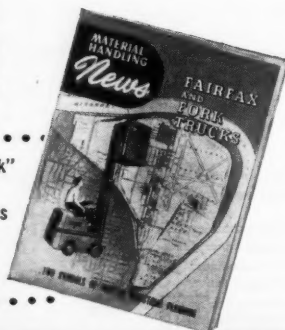


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axle is discharged from the turntable it is retained in the concave area.

The axle trips a switch arm which actuates the pneumatic cylinder of the elevator. The load is thus lowered to the bottom deck. The concave elevator section drops below the bottom track level and the defective units roll off by gravity to the scrap track. The advancing axle trips another switch, which returns the pneumatic cylinder to the up position. A second button at the inspector's station is then pushed, which returns the steel leveling plates to vertical. Thus the heavy axles (averaging about 900 lb. each) are shunted over right-angle turns and on two different levels without the need of manual manipulation on the part of the operators.

The scrap axles from the lower deck are removed four at a time by fork lift truck, and tiered in the storage yard.

#### Hoists and Fork Lift Truck

The okayed axles are removed from the upper deck by the lathe operators with the type of electric one-ton jib hoists shown in one of the photos. These I-beam jibs average about 15 ft. in length, giving a radius which covers Rack No. 2, the lathe, and also the finished axle rack (No. 3) beside each machine.

A goose neck type grab is used for handling the axles at this point. The semi-circular pressure point is adapted to the contour of the units, and a chain is placed around the load at the lifting point, whose links lock into a slot. The grab is placed on the axle so that the hook is in the center, balancing the load during suspension in the horizontal position.

The 117 ft. length of Rack No. 2 keeps an ample supply of axles ahead for all lathe operators, and the individual hoist serving each station makes the workers independent of any material handlers.

Note the position of the units indicated as Rack No. 3, on which the completed axles are placed by

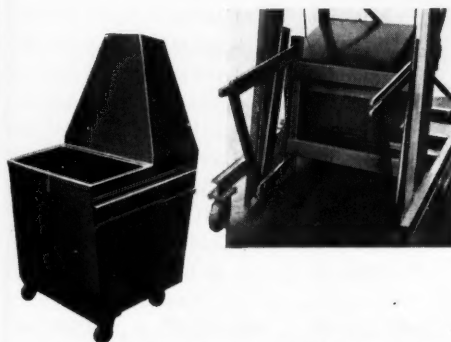
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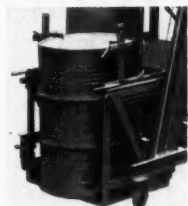
**F**REE ROLLING SKIPS lock on the arms of the CESCO Dumper for lifting and dumping. They roll on Colson Casters from stock pile to scale to the Dumper and save hours of extra handling.

A variety of skips and loaders are available including: bag dumpers, drum dumpers, dust control types and many others. If you have a handling problem requiring lifting, upending and dumping—it may already have been solved and filed in our CESCO Dumper case histories—write today for information.

**FILL IT...ROLL IT...WEIGH IT...ATTACH, LIFT AND DUMP IT**



BAGS



DRUMS



BULK

DUMPING HEIGHTS  
5, 6, 7, and 9 feet

**A**LL KINDS OF MATERIALS can be handled easier and faster by a single CESCO Dumper and its variety of skips. That's why it's just as useful in receiving department and loading dock as in warehouse and mixing rooms. It moves on its own casters and locks in place with two floor locks. It lifts the load by cable and pulley powered by a half horsepower electric motor. Has a lifting capacity of 500 lbs. or 6 cu. ft; can handle up to 50,000 lbs. per hour. Three button control switch—UP, DOWN and STOP—acts instantly and stops the travel without coasting.

Cesco dumpers are made in standard dumping heights of 5, 6, 7, and 9 feet and in other sizes on order. Many special types of skips are made for specialized jobs.

The CESCO dumper prevents waste by spillage . . . eliminates accidents to labor . . . reduces costs of handling dry materials or liquids in bags, bulk or drums.

**COLSON Equipment & Supply Co., 1317 Willow St., Los Angeles**



### WRITE FOR LITERATURE

Here are eight picture-packed pages showing the various uses of the CESCO Dumper and its mechanical features. Write for your copy today!





# A Safe, Low-Cost Method For Rolls of Linoleum\*

**I**N MOVING such long, cylindrical, heavy objects as rolls of linoleum the possibility of improper

(\*A paper submitted in the 1947 FLOW Cost Analysis Contest.)

balancing and resultant damage is usually present. The situation is even more troublesome when the quality might be impaired beyond saleability from dropping, scraping, or other damage.

Such is the problem that faces us each day at Armstrong Cork Company. While most designs and patterns can be handled by so-called standard handling procedures, some types of linoleum receive uneven

## WAREHOUSING—BEFORE AND AFTER

| Commodity | Old Method  | New Method | Savings/Yr. |
|-----------|-------------|------------|-------------|
| 1         | \$ 3,677.00 | \$ 941.00  | \$ 2,736.00 |
| 2         | 10,256.00   | 3,339.00   | 6,917.00    |
| 3         | 4,730.00    | 1,210.00   | 3,520.00    |
| 4         | 5,848.00    | 1,904.00   | 3,944.00    |
| 5         | 2,161.00    | 482.00     | 1,679.00    |
| 6         | 2,913.00    | 949.00     | 1,964.00    |
| 7         | 2,258.00    | 578.00     | 1,680.00    |
| 8         | 946.00      | 242.00     | 704.00      |
| 9         | 5,670.00    | 1,361.00   | 4,309.00    |
| 10        | 2,025.00    | 486.00     | 1,539.00    |
| 11        | 5,054.00    | 2,246.00   | 2,808.00    |

Totals ....\$45,538.00    \$13,738.00    \$31,800.00

While the savings realized in our warehousing section are noteworthy, those in the shipping operations are even greater, due to the additional distance to the shipping docks and platforms.



## SHIPPING—BEFORE AND AFTER

| Commodity | Old Method  | New Method  | Savings/Yr. |
|-----------|-------------|-------------|-------------|
| 1         | \$13,514.00 | \$ 6,710.00 | \$ 6,804.00 |
| 2         | 2,958.00    | 1,469.00    | 1,489.00    |
| 3         | 16,240.00   | 8,064.00    | 8,176.00    |
| 4         | 2,958.00    | 1,469.00    | 1,489.00    |
| 5         | 12,760.00   | 6,336.00    | 6,424.00    |
| 6         | 2,480.00    | 1,231.00    | 1,249.00    |
| 7         | 3,190.00    | 1,584.00    | 1,606.00    |
| 8         | 2,886.00    | 1,433.00    | 1,453.00    |
| 9         | 16,748.00   | 8,316.00    | 8,432.00    |
| 10        | 5,481.00    | 2,722.00    | 2,759.00    |
| 11        | 1,958.00    | 972.00      | 986.00      |

Totals ....\$81,173.00    \$40,306.00    \$40,867.00

Total yearly savings for warehousing and shipping .....\$72,667.00

**TWENTY ROLLS** ready to be moved as unit, left. Note ramp in closed vertical position. At right, operator loading pallet-type roll cage.



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### By D. CURTIS AURIDON

Industrial Engineer  
Warehouse & Finishing Dept's.  
Armstrong Cork Co.  
Lancaster, Pa.

markings which form highlights and shadows. These detract from rather than add to the saleability of the product.

Past practice in the transporting of packaged linoleum has been to use hand trucks for short intrafloor movement while vertical chain conveyors, belt conveyors, etc., provide interfloor handling in the various warehouses. While these methods are satisfactory and economical for most types of linoleum, the material involved here could not be moved in the usual way. Therefore, the next best method was to move a roll at a time and live with high handling cost until some other method could be devised.

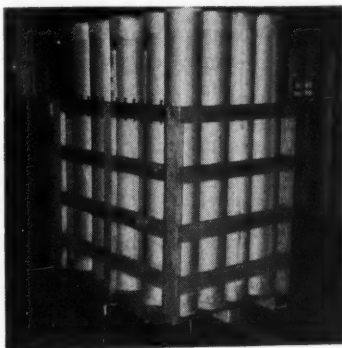
#### Multiple-Roll Warehousing

Although the problem we were faced with might have been solved in one of several different ways, the cost of installation was prohibitive in most cases. The pallet-type multiple-roll cage, shown in the exhibits, was finally found to be the answer to our problem. It not only provides adequate protection for the various commodities handled, but moves in one load from eight to 12 times the amount formerly transported!

Sturdy construction is provided by interlocking vertical and horizontal, sanded and varnished oak sides which socket to the base stringers supporting the 16-gauge steel over a 1/2" plywood floor. Heavy carriage bolts secure all joints, and are also used on two opposite and parallel top rails to provide anchorage for the rubber-covered snubbing chain. As the weight per roll varies from 200 to 500 lb., individual roll movement could be hazardous. The pallet cage used holds the rolls in a com-

pact unit-mass during transportation.

To load and unload the cage, the operator lowers the hinged metal ramp (which forms one end in the vertical position) and removes the rolls via a two-wheeled hand truck, as shown in one of the photos. The angle of slope has been maintained at a minimum to facilitate loading and unloading. Once unloaded, the



FOUR THOUSAND pounds of linoleum ready for the shipping platform.

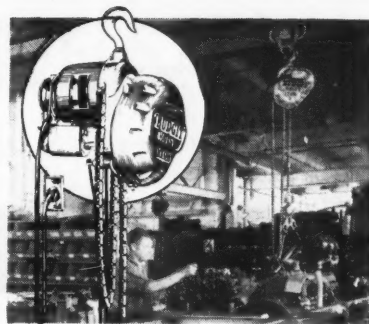
rolls are either positioned in nearby bays for stocking, or in boxcars to be prepared for shipment. Note that the entire load unit is transported by a motorized pallet hand truck.

#### Substantial Cost Reductions

In the accompanying charts, the eleven types of linoleum listed are included in the special group serviced by this new method. They show the "before and after" figures with the savings per year in the last column:

Adding the savings shown in the shipping chart to those in warehousing, the total savings per year for the two operations becomes \$72,667.00.

It is gratifying to be able to point to appreciable dollar savings through better handling methods. It is equally gratifying to know that the fatigue of each worker involved has been lessened, making the work more interesting and all concerned happier through better working conditions.



## How save more?

Perplexing, isn't it? We mean that nightmarish question of how to save more without reducing operations below profitable production. There's an answer to it.

Just put a portable 'Budgit' Hoist to work lifting and handling loads on your production, assembly, and inspection lines. You'll notice from the first lift how much faster the work moves along. How each worker increases his production, when freed from back-breaking manual lifting. How a 'Budgit' Electric Hoist lowers risk insurance, operating costs, and — lifts profits!

'Budgit' Electric Hoists can be put to work as soon as they're delivered. There's no installation costs, no accessories to buy. They're complete lifting units in themselves. Just hang up your 'Budgit' Hoist, plug it into the nearest electric socket, and use!

By increasing production, lowering operating costs, reducing risk insurance to a minimum, doing away with installations costs with a 'Budgit' Hoist, you've answered your question "How save more?"



Made in sizes to lift 250, 500, 1000, 2000 and 4000 lbs. Prices start at \$119. Write for Bulletin No. 391.

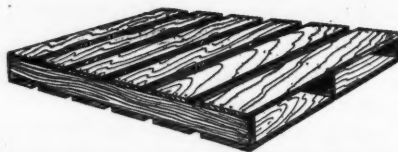


## 'BUDGIT' Hoists

MANNING, MAXWELL & MOORE, INC.  
MUSKEGON, MICHIGAN

Builders of 'Shaw-Box' Cranes, 'Budgit' and 'Load Lifter' Hoists and other lifting specialties. Makers of 'Ashcroft' Gauges, 'Hancock' Valves, 'Consolidated' Safety and Relief Valves, 'American' Industrial and 'Microsen' Electrical Instruments.

# ON THE



# PALLET

## NEWS . VIEWS . TRENDS

ONE of the largest certified welding jobs ever undertaken by an aircraft manufacturer—over two and one-half miles of certified weld were required—was recently completed at Texas Engineering and Mfg. Co., Inc. Here final units of a contract calling for 160 B-36 bomb-bay tank storage racks now are being delivered. The racks, part of the specialized handling equipment being built for the B-36, are of arc welded pipe construction throughout, three-in. black pipe being used for the base and two-in. black pipe for the superstructure. Each unit measures 10' 11½" x 11' 3½" at the base, stands 9' 8½" tall, weighs approximately 2000 lb., and requires 1006 ins. of weld.

TRADE show exhibitors of equipment which does not itself have attention getting characteristics such as novelty, motion, color or on-the-spot demonstrability, will be interested in a demonstration-display technique being employed by the Gould Storage Battery Corp. at 1949 trade shows. Gould uses visitor-operated models of battery-powered equipment, such as industrial lift trucks and mine shuttle cars. The small models are operated by life size controls and perform every operation of full size equipment. Groups of "grown-up kids" have awaited turns at the controls at every show at which models have been used. Such "live" models can also be used to put across points in plant layout, methods, traffic, material handling and related fields.

THE world's largest precision hydraulic press for conveyor belts has been put into successful operation at the Passaic, N. J. factory of the Manhattan Rubber Division, Raybestos-Manhattan, Inc. It is designed to meet the demand for more and larger conveyor belts for mines and industry. Built to the user's specifications by The Baldwin Locomotive Works, the press will vulcanize conveyor belts under controlled pressure and temperature. The assembled press weighs 619,000 lb. One of the 40-ft. platens weighs 45 tons, and took three days to travel 100 miles by special truck. An addition to the factory over 150 ft. long was required to house the gigantic press. It is understood that Manhattan Rubber engineers developed the system of temperature and pressure controls to maintain a uniform condition on each platen of the huge press. A check of several platens indicates that there

is less than a two-degree variation in temperature over any one platen surface with this system of controls, despite sudden and large load changes and a surface area equal in size to that of a bowling alley.

THE scientific and technical developments produced in the U.S. wartime atomic energy program were necessarily shrouded in secrecy. To date, approximately 2500 documents of various types have been declassified. While the majority of these papers pertain to nuclear science, there are a number of technological papers containing information of interest to U.S. technology and industry. The major part of what might be termed industrial information is contained in some 250 papers. A list of these documents is available from the Document Sales Agency, P. O. Box 62, Oak Ridge, Tenn.

MAHLON D. HARWELL and Richard K. Degener have organized American Sales Engineers. The concern will design and distribute tubular material handling equipment. All of the products will be manufactured by the American Metal Products Co. at a newly equipped Detroit plant adjacent to its present facilities. The manufacturing company has been producing tubular parts for many years and is now entering the material handling field for the first time. It will build tubular tiering racks, pallet racks and steel containers. Harwell and Degener have developed several new racks and containers which are to be marketed shortly.



R. K. Degener



M. D. Harwell

PLANS for introduction in England of the low pressure air conveying system, developed by Convair Corp., have been announced by the company. The convair system was developed during the past four years and will be a feature of the new \$500,000 plant of Jackson Brothers, Ltd., major British bottle manufacturers at Knottingly, England. In this fac-

(Turn to page 46)

## NEWS FROM THE SALES FIELD

**A**PPPOINTMENT of Harold B. Staniar to its sales staff has been announced by J. M. Barclay, Inc., 397 Market St., Newark, N. J. Barclay is sales representative for the Automatic Transportation Co., Chicago. Staniar will handle the Union County, N. J., territory.

**C**HAIN BELT CO. has announced the appointment of Douglas Jones as manager of the Salt Lake City District office. He will operate as the Douglas Jones Co. at 1551 Redondo Ave., Salt Lake City. Jones is well known in Utah engineering circles through his activities in various engineering societies. At present, he is vice-president of the Utah Society of Professional Engineers.

**F.** L. PURDY CO., Columbus: this company has been appointed by the Ironbound Box & Lumber Co. as representative for the southeastern Ohio territory. The Purdy organization consists of F. L. Purdy and William R. McKinley.

The S & T Equipment Co., Inc. has been appointed by Ironbound as representative for the state of Alabama and the northwest portion of Florida. S & T's staff includes H. S. Turner, Jr., J. W. Sturdivant, J. Tyler Turner and Richard F. Turner.

**H**INES BEARINGS AND INDUSTRIAL SUPPLY CO., Billings, Montana: This company was named distributor of Hewitt industrial rubber products in Billings and surrounding territory. Announcement was made by J. H. Hayden, vice president in charge of sales, Hewitt-Robins Inc., Buffalo, N. Y. The Hines company is owned and operated by L. R. Hines, president. Paul E. Cooper is store manager. Three salesmen travel the territory.

### NEW 1949-1950 DIRECTORY

The first issue of the FLOW directory of Material Handling Equipment and Accessories was received with great acclaim, and now orders are being accepted for the second, improved issue at \$5 per copy. Several sections have been expanded and new ones added. Send your order now.

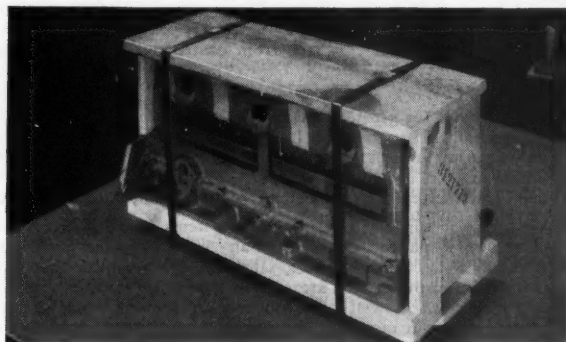
# ACME STEELSTRAP can save money for 9 out of 10 shippers

**Read how Nash saved 75%  
in crating cylinder blocks!**

Building Nash automobiles involves the problem of moving these blocks safely and economically at the Milwaukee Parts Plant, Nash Motors Division of Nash-Kelvinator Corporation. Acme Steelstrap has helped simplify this operation.

By methods developed by Nash engineers in cooperation with Acme Shipping Specialists, cylinder blocks, for example, are crated quickly but safely at *one-quarter* the cost of the former methods! Methods were developed for other products to produce similar savings.

Similar savings in time, labor, and materials are reported by over 45,000 other users of Acme Steelstrap and Unit-Load Band. Why not find out what these products can do for your packaging and shipping operations? An Acme Shipping Specialist will be glad to make an analysis without obligation. Mail the coupon today for further details.



Crated cylinder block strapped with Acme Steelstrap.

### STRAPPING DIVISION ACME STEEL COMPANY

NEW YORK 17    ATLANTA    CHICAGO 8    LOS ANGELES 11

ACME STEEL COMPANY, Dept. F-109  
2838 Archer Avenue, Chicago 8, Illinois

- ☐ Send free booklet "Savings in Shipping."  
☐ Have representative call.

NAME \_\_\_\_\_

COMPANY \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_ ZONE \_\_\_\_\_ STATE \_\_\_\_\_



**BERGER**

## Wedge-Lock Steel Shelving



### LIVE STORAGE FOR *Fast Moving* STOCK



Team up your mobile handling equipment with easy-to-use Berger Wedge-Lock Steel Shelving and watch materials move faster all along the line.

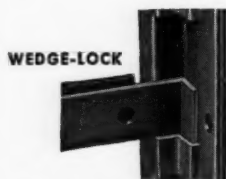
Exclusive Berger Wedge-Lock construction eliminates gussets and sway-braces. It leaves shelves, racks and

bins open and clear . . . free from obstructions that might impede materials movement.

And, Wedge-Lock gives you the most storage capacity in the least area. It bears far greater weight than any other shelving, yet requires a minimum of floor space. Its great strength and tight, sway-proof joints permit unusually high stacking, giving you the chance to use overhead space to good advantage. As a result, aisles and floors remain open and uncluttered, permitting free movement of men and materials.

Wedge-Lock efficiently accommodates items of all sizes and shapes from pins to pallet loads . . . for any length of time from a minute to a month . . . easier, faster, safer. It neatly handles your moving inventories in production areas, in receiving and shipping, in assembly and inspection as well as in stockrooms. Include Wedge-Lock Steel Shelving in your materials movement plans and step-up the efficiency of all your materials handling equipment. Write us for literature and full information.

**BERGER MANUFACTURING DIVISION**  
**REPUBLIC STEEL CORPORATION**  
Canton 5, Ohio



*The heavier the load—  
the tighter the joint*

CONVERTIBLE STEEL SHELVING • FLEXI-BILT STORAGE UNITS • TOOL ROOM and SHOP EQUIPMENT  
STEEL LOCKERS • STEEL OFFICE EQUIPMENT



### HANDLING IN AIR AGE . . .

(Continued from page 23)

a truck, and the hook can also be used for towing non-powered vehicles up a ramp.

Pre-loaded pallets of 5000 lbs. can be accommodated. Matching tie-downs on pallet and plane permit quick fastening and quick release. With this equipment it is possible to load and stow 20,000 lbs. of cargo in less than a half-hour.

#### Bridge Cranes and Elevator

Another cargo transport with built-in handling facilities is the Douglas Globemaster, developed during the latter part of the war for global operations. Used for very limited service during the Berlin air lift, it carried heavy equipment on runs from America to Europe. Three electric powered cranes are used on this transport to handle lifts up to 16,000 lbs. Two of these cranes are of the underslung, bridge type traversing double rails running the length of the cargo area. The third crane is equipped with a boom for heavy loading operations through a cargo door on the left side of the fuselage. Also incorporated in this basic design is a detachable floor area at the rear, that serves in conjunction with the twin cranes as an electrically operated cargo elevator. Palletized loads, large bulky objects and small vehicles can be easily handled by either lifting from this platform in lowered position or by lifting the platform and load as a unit. The twin cranes furnish four suspension points for lifting the elevator platform and for spotting the load.

#### Hoist Tracks on Underside of Wing

A revised version of this cargo transport has recently been developed. The basic design remains the same, but the cargo capacity has been increased and large loading doors have been added to the fuselage nose.

The Martin Mars, huge flying boat used by the Navy, incorporates a unique overhead handling system for loading bulky cargo directly from either side of the fuselage, also shown in the exhibits. The equipment utilizes a 5000 lb. capacity crane traveling on twin recessed overhead tracks. This crane, of the low or underslung rectangular bridge type, is suspended from two parallel tracks built into the bottom skin of the wing. The tracks extend outboard from the center line of the fuselage on both sides of the plane, thus permitting straight-through loading or unloading from either side. Emergency hand cranks are provided in the event of a power failure. For the control of this crane, a push button panel is located on the forward bulkhead or partition of the main cargo compartment just inside the left door. The operator thus has a vantage point for control during the handling operation.



For efficient "on-the-crane" weighing . . . saves time and material handling.

Direct reading—capacities to 30,000 lb. Guaranteed accuracy . . . each scale calibrated at factory. Prices from \$882 to \$1385. Complete literature upon request.

**THE A. H. EMERY CO.**

STAMFORD CONN

## CM METEOR

● Heavy duty electric hoist for stationary, plain, geared or motor driven trolley suspension. Single and two speed models. Capacities: ½ to 5 tons.



Here's Plant Improvement that

*Pays off in  
3 Ways*

# HOIST POWER

## LOWERS HANDLING COSTS

Picks up raw materials, or finished parts for assembly and moves them along for pennies in power and seconds in time.

## ACCELERATES PRODUCTION

Takes the slowing up "lags" out of assembly line movement. One man precision "spotting". Speeds up handling in shipping.

## IMPROVES PLANT MORALE

Saves the backs and muscles of

men so that they may produce with "morning" efficiency in late afternoon. Aids in accident control.

Frankly, we don't know how many factories have cut costs by putting CM Electric Hoists on production jobs, but we *do know* they keep coming back for more and more Meteors and Comets. You couldn't ask for more convincing evidence of a product's usefulness to industry than a constantly growing demand.



CM Meteor and Comet advantages are fully described in the complete CM Catalog. Write us for a copy and the name of your local distributor.

## CM COMET

High speed, sturdy, portable electric hoist. One hand control. Plug in on single or 3 phase power line. Capacities: ¼ to 1 ton.

# CHISHOLM-MOORE

## HOIST CORPORATION

(Affiliated with Columbus McKinnon Chain Corporation)

GENERAL OFFICES AND FACTORIES: TONAWANDA, N. Y.

SALES OFFICES: New York, Chicago and Cleveland • Distributors Everywhere

## YARD CRANEWAY . . .

(Continued from page 15)

length. Bar stock is stored in racks (in the rear half of the yard). To this partial list must be added bundled sheet steel as well as many types of component parts.

The railroad spur, as can be seen from the flow diagram, extends only partially along one side into the yard. The reason is that usually no more than three cars of chassis side rails are received at one time, and these can be accommodated on the trackage provided. The spur was held to the shortest length possible in order to save the maximum yard area for storage.

### Crane Operating Time, Duties

Here is how the crane's time is divided between the various functions. Truck unloading at the T-dock consumes about 10 per cent of its time; rail car unloading about 20 per cent, and filling material requirements for the factory of from 50 to 70 per cent. Any remaining time is taken up with rearranging the stock. For example, the crane may be stacking unitized loads of rear axle housings to a height of 15 ft. in order to make room for other types of products that are expected to arrive.

The load units of chassis side rails range from 12 to 20 pairs per bundle, depending on their size. A car of this material is unloaded in about 1½ hours (if there are no interruptions). The stacks for these and other fast-moving items are built close to the track, in order to minimize crane travel. These stock-piles are also near to the north end of the yard, which in turn is close to the shops. Slow-moving items are stored at the far (south) end of the area.

Grommet type wire rope slings with equalizing thimbles are used for all work, with the lifts cradled in the loops. Two hook-up men are regularly employed.

When side rails are to be delivered from the yard to the assembly department, the crane spots the lifts on a special frame truck. Of channel and angle iron construction, this truck is four ft. wide and 20 ft. long, with stakes at the sides. It accommodates up to 20 pairs of side rails. Three of these vehicles are in regular use. While two are in the shop being unloaded, one truck is in the yard to receive a load. Uninterrupted supply to production is thus assured. As one of the photos shows, these trucks are hitched to a crawler-mounted tractor for movement to the shop. Long lengths of bar stock are likewise transported on these vehicles, which have tires of solid rubber for easy rolling.

### Delivering to Location

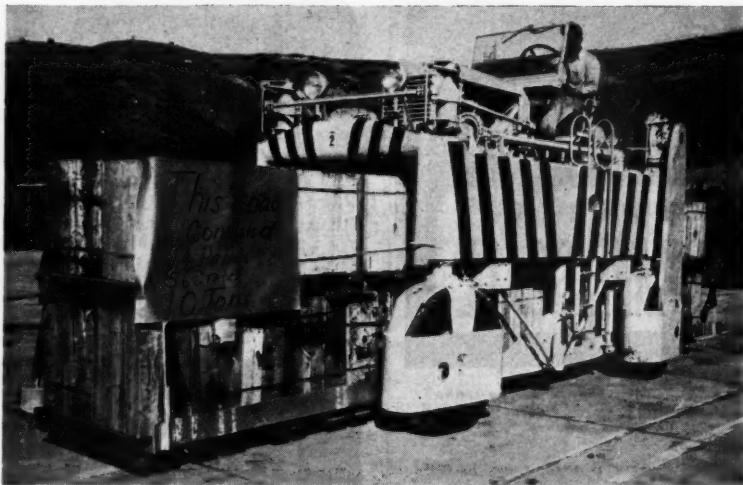
The combination truck-and-rail T-dock at the north end of the area has a capacity for 12 highway

trucks and four freight cars. The open-top highway vehicles (spotted at the south end of the dock) are unloaded by the bridge crane. (Its north end is roofed and is used for lighter receivals, whose handling by hoists is described below.) Such items as rough and finished components, usually unitized, are spotted by the crane on pallets, steel skids, and/or trailers for delivery to the various points of use within the buildings.

At the roofed portion of the dock, lighter types of items are received. This section is covered by monorail trackage on which three one-ton hoists are installed. Three monorail spurs extend from the main line over as many truck bays (approximately halfway over the open-top delivery vehicles). Incoming materials are thus accessible for power handling. In other words, the one-ton electric hoists handle lifts which are too heavy for physical lifting and too light for the crane.

**STRADDLE TRUCK EXTENSION SHOES**, shown here, were originally developed by superintendent Frank Edwards, Pt. Molate Naval Fuel Annex of Richmond, for handling petroleum drums on pallets. This unusual attachment was first displayed in Oakland,

special large skids or platforms. They bolt to the regular gripping shoes of the truck. Except for the addition of four bolt holes, no changes need be made in the truck. Forty full drums weighing about 10 tons can be thus picked up and carried. The number



Cal., last December at the Materials Handling and Packaging Conference sponsored by the Navy Industrial Association and the Bureau of Supplies and Accounts. The extension shoes increase the possible length of palletized loads and eliminate the necessity of

may grow to 60 upon further development. The extensions have also been successful in cargo handling. Two types have been used: one with fork-type fingers designed to fit into the sides of palets for lifting, and the other of angle iron.—*Courtesy, Hyster Co.*



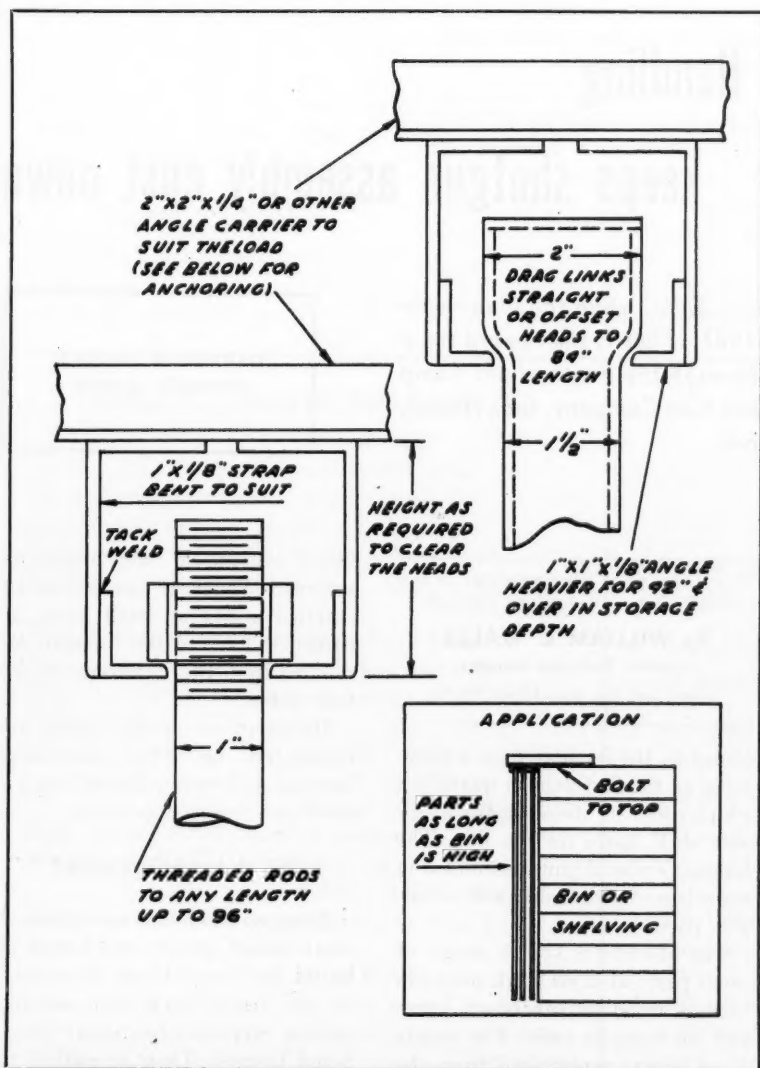
# IDEA conveyor

A department devoted to new methods that were developed for improved material handling in your plant. Send us your ideas which have been adapted to actual operations. Ten Dollars will be paid for each one accepted. Include a sketch or photo, or both.

## Racks for Long Parts

**S**KETCHED below is a method for effective storage of parts which are handled piece by piece in small volume and where protection against damage is essential. Characteristics of such parts often give a clue to the most suitable storage method, as in this case. The principle is to suspend the items by the

rests inherent in their shapes. The welded structures are easily made. Since no dunnage and special hooks are involved, effort and skill in handling are at a minimum. Parts protection is automatic and positive. The 96" shapes weigh ?? to 35 lbs. and average between 12 and 13 lbs. Effective bin depth is 48". Bin ends or wall areas at ends of aisles are handy for such storage racks.



## ECONOMIZE

4 ways with

**COLES**  
CRANES

### 1. LOW OPERATING COSTS!

One operator of four Coles Cranes claims the average consumption of standard gasoline as four to five gallons a day.

### 2. REDUCE MAINTENANCE COSTS!

Gasoline electric control does away with costly transmission systems and troublesome clutches as it increases the smoothness of operation. All of the gears are enclosed in oil-tight cases.

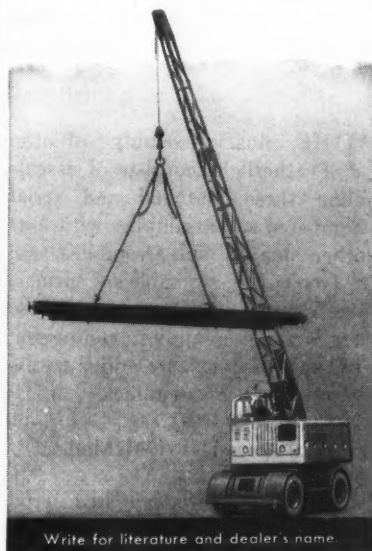
### 3. ELIMINATE COSTLY REPAIRS!

Safe-Load Indicator automatically cuts the electric circuit when the load is too heavy or too high. This safe-load indicator virtually eliminates overturn, protects the operator and expensive equipment.

### 4. MINIMUM YARD SPACE!

The huge centrally situated "A" frame upon which the boom is mounted, coupled with stability of full circle swing, enables operator to work in restricted yard space.

COLES CRANES have been designed in cooperation with industrial users all over the world to guarantee maximum performance with maximum efficiency.

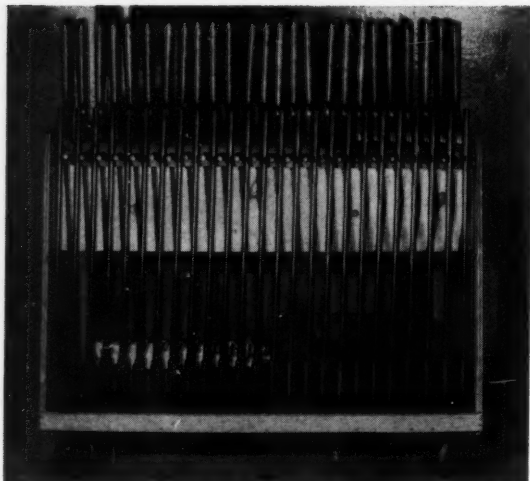


Write for literature and dealer's name.

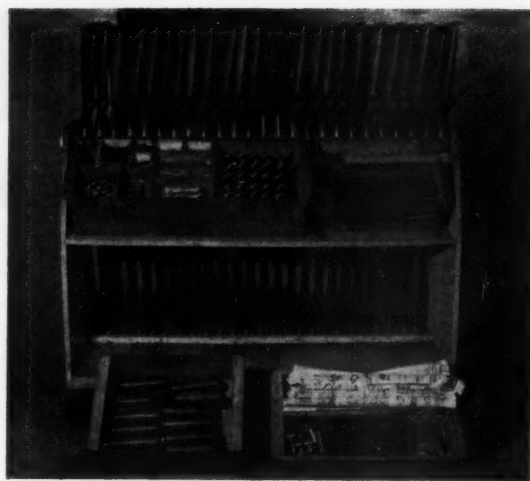
**COLES CRANES, INC.**

SALES • SERVICE • PARTS  
4307 S. Paulina St. Chicago 9





LEFT SIDE of final assembly truck. Top—stock assembly. Center—barrel assembly. Bottom—receiver assembly.



RIGHT SIDE of final assembly truck. Trays tipped to show contents. See further explanation in photo on page 47.

## Improved Handling

## keeps shotgun assembly cost down

*Postwar assembly costs increased only 37%, while the plant-wide average pay increased 140% over 1941. That is the reward for a change in handling finished parts through the Featherlight Pump Gun Final Assembly Line at the Ithaca Gun Company, Inc., Ithaca, New York.*

**CASTERED TRUCKS  
STORAGE RACKS**

**T**HE final assembly of the Featherlight consists of assembling three matched and serial numbered sub-assemblies with four other major sub-assemblies, 16 minor sub-assemblies, springs, small parts, and screws. These parts and assemblies, comprising 19 types of items, are added to the barrel-receiver assemblies.

### Final Assembly—1941 Method

In 1941 the three matched, serial numbered parts were delivered to the final assembly line on the second floor as they were finished and there stored in the racks to await assembly. Small parts were requisitioned by the foreman from a storeroom on the first floor in quantities which could be stored in the available shelf space on the line. The foreman ordered guns assembled in accordance with sales and available parts.

This was a prize winning paper in the 1948 Flow Cost-Analysis Contest.

**By WILLIAM L. WALLS**

Assistant Production Manager  
Ithaca Gun Co., Inc., Ithaca, N. Y.

The assemblers kept a supply of small parts at their work places in various wood or cardboard boxes and lids from tin cans. The supply of parts was replenished from the

boxes stored on the storeroom shelves. Whenever an assembler emptied a box of small parts, he turned it over to the foreman for refilling from the storeroom on the floor below.

Defective or spoiled parts accumulated on the assemblers benches and were collected once a week and reported as scrap.

### Should Assemblers Walk?

When an assembler was informed what model, gauge, and length of barrel was wanted next he walked to the barrel rack and selected several appropriate, serial numbered barrels. Then he walked to

the receiver rack and found the receivers with serial numbers corresponding to those on the barrels. He carried these parts to his work place and started the assembly by adding the magazine, slide handle, yoke, etc. to complete the assembly in front of the receiver. He placed this assembly on a truck; when filled, it was pushed to a second assembler.

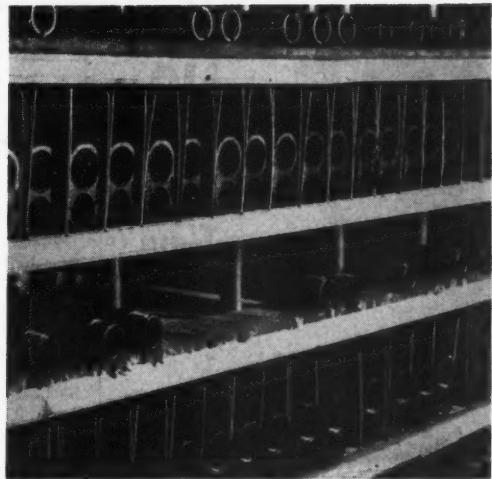
The second operator took the gun from the truck to install and adjust all the shell handling and firing mechanism inside the receiver so that the gun functioned properly with dummy shells. Then he walked to the stock storage rack to find the stock with the same serial number as the gun he had on his bench. He carried the stock back to the bench, assembled it to the receiver, and placed the completed gun back on the truck.

When the truck of guns was completed, it was sent from the assembly line to the range for function testing with live shells.

#### The Post-War Problem

On V-J Day we were faced with converting from the manufacture of cal. 45 automatic pistols to the

**SPECIAL RACKS** for finished receiver and barrel assemblies in storage. Engineered storage operation was vital to new method.



manufacture of shotguns. This meant the removal of many machines and the installation of many special machines which had been stored about a mile across town—down one, and up another of Ithaca's hills. The unprecedented demand for shotguns built up during the war made it imperative that we prepare for the highest possible production in every department. This required efficient use of floor area.

When we came to lay out the assembly area, we realized that

under the 1941 method the assemblers were leaving their work areas vacant while they were getting parts from the racks. Full utilization of the area and better control of parts were our guides in developing our present method for the Final Assembly Department.

#### Final Assembly—1949 Method

The new layout placed a long narrow finished parts storeroom alongside and parallel to the as-  
(Turn to page 47)

## TANGIBLE HANDLING SAVINGS

At the 1941 Production rate 23,275 additional hours would have been required for the latest 12 months' production. At plant-wide average earnings this equals  $23,275 \times \$1.52 =$  .....\$35,381.00

Plus the cost of providing 40 sq. ft. of floor area for each of 10 additional final assemblers if assembly rate was the same as in 1941.

$$40 \times 10 \times \$10 = 4,000.00$$

$$\text{Savings} \dots\dots\dots \$39,381.00$$

Less cost of 8,000 hours in storeroom at average plant-wide hourly earnings.

$$\$8000 \times \$1.52 = \$12,160.00$$

Less cost of building 20 special trucks with trays.

$$20 \times \$70.00 = 1,400.00$$

$$\underline{\$10,760.00}$$

$$\text{Total Net Savings} \dots\dots\dots \underline{\$28,621.00}$$

## INTANGIBLE BENEFITS

1. Better control of parts.
2. Prevents careless damage or waste of parts.
3. Places responsibility for correct receipts and requisitions with the storekeeper.
4. The uniform method of storing makes the taking of an inventory easier.
5. Prevents the interference resulting under the old method when two or more assemblers wanted to get the same parts at the same time.
6. Controls the quantity of any particular type of gun assembled.
7. The transportation time has been cut considerably because all parts now move on trucks of 25 pieces.
8. The assembler has all the parts he needs to complete the truck of guns. He does not have to walk to the storage shelves for parts.



**NO**  
=  
**Down Time**



## Plant Superintendent looks at **MONARCH SOLID TIRES**

No down time for tire maintenance — right! But that's only part of the story. Monarch Solid Tires have an extra long service life, so they lower materials handling costs that way, too. They're tough, stable, sure-footed, and they can't puncture — Monarch-equipped vehicles go anywhere in the plant.

Monarch specialization pays off for you in better industrial tires, including such types as Monarch Easy-Roll, Cushion, Static Conductor, and Neoprene Tires.

Write for specific information on the use of Monarch Solid Tires in your plant. **THE MONARCH RUBBER CO., 501 Lincoln Park, HARTVILLE, OHIO.**

*Specify Monarch Solid Tires on your industrial vehicles. Replacement tires available from the manufacturer of your equipment.*



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Specialists in Industrial Solid Tires and Molded Mechanical Rubber Goods

## IDEAS YOU CAN USE

### Tested techniques for better production

**BLOOD CARRIED BY BELT CONVEYOR** — Package conveyor belting was selected for an unusual installation at Jefferson Medical College Hospital in Philadelphia.

The blood donor receiving room of the hospital's Charlotte Drake Cardeza Foundation is separated from the institution's blood bank and laboratory by Clifton Street. Past practice was to have newly-filled blood bottles carried between the two buildings by attendants — leaving one building, crossing the street, entering the other. Empty sterilized receptacles, transfusion equipment, etc., were returned in the same manner.

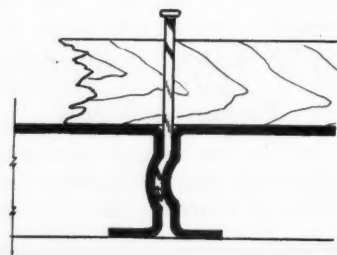
A reversible belt conveying system was installed, consisting of an incline

belt from the street floor of the donor section; a long horizontal length through part of the basement, then under Clifton Street to the basement of the other building; and, making a right-angle connection, into the blood bank and laboratory. Total length of the installation is approximately 300 ft.

Operated in reverse, the belt carries empty bottles, other small equipment, supplies, messages, etc., back to the donor section, with a simple intercom system signalling the required attention. A complete passage requires an average of only 1 minute, 45 seconds — a big saving in time which, added to the release of personnel for other duties, has contributed to lower costs and increased efficiency in this important

### WOOD NAILS IN STEEL FLOORS—

The Pennsylvania Railroad has installed all-purpose nailable steel flooring in 100 gondola cars and has ordered its application to an additional 100 cars. The flooring consists of curved-flange steel channels separated by grooves in which ordinary nails can be driven. The grooves are filled with plastic to prevent loss of fine freight carried in bulk. Cars so equipped can thus handle finished goods which must be blocked in place



by nailing to the floor as well as rough heavy materials which require a steel floor. The new installation will eliminate much car switching and assem-

bling, now necessary to provide floors suitable for the type of freight to be carried.—Courtesy, Great Lakes Steel Corp.



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**CAR UNLOADERS**  
for unloading hopper  
bottom cars. Models  
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**FLAT or TROUGH  
BELT CONVEYORS** for  
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gravel, etc. to trucks or  
piles. Models 481 & 482.



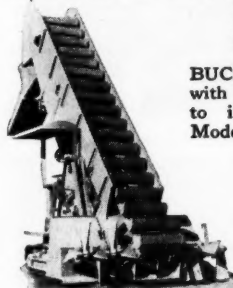
**DRAG  
CONVEYORS**  
for handling all  
sizes of coal and  
coke. Model 486.



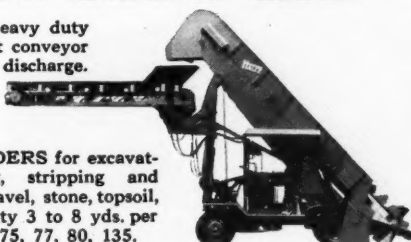
**PACKAGE  
CONVEYORS** for hand-  
ling bags, boxes, crates,  
cartons, hampers, etc.  
Model 485.



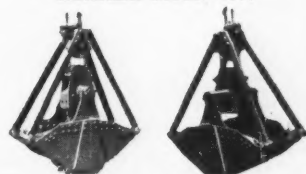
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CONVEYORS** made in eas-  
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sections. Portable or sta-  
tionary for handling all bulk  
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**BUCKET LOADERS**, heavy duty  
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to increase zone of discharge.  
Model SBC.



**BUCKET LOADERS** for excavat-  
ing, rehandling, stripping and  
loading sand, gravel, stone, topsoil,  
coal, etc. Capacity 3 to 8 yds. per  
minute. Models 75, 77, 80, 135.



Heavy Duty or Light Duty Clam-  
shell Buckets for high speed exca-  
vating or rehandling.

For further information, write, phone or wire. Experienced Hais representatives are located in all principal cities.

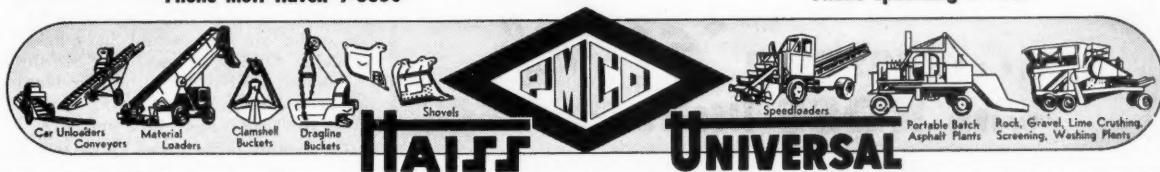
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The Nutting Jack is the ONLY jack operated entirely by gravity and leverage. With no springs to break, there is no danger of your whole jack-skid system suddenly being put out of service.

One lift truck and two dead skids cost about the same as two Nutting Jacks and twelve semi-live skids. That's one reason why the Nutting Jack and Skid system can be such a money-saver in your plant. Material stored on semi-live skids is made mobile in a hurry. The jack may be coupled to one skid, then uncoupled and coupled to another faster than the time it takes to tell about it.

### Send For Bulletin 48-JS

Look in your classified phone directory for your Nutting representative, or write for Bulletin 48-JS. It will pay you to get all the facts on this superior Nutting Jack-Skid handling system.

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#### FINGER BAR

Controls Load and Tongue

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Provides perfect swivel-  
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\*Enterprise Wheel & Car Corporation, Bristol, Virginia

## ... they're a "SNAP" with ROSS lift trucks

Big, bulky loads can cause increased handling costs. But at Enterprise Wheel & Car Corporation such costs have been greatly reduced by a ROSS Lift Truck. It handles raw materials in 5-ton loads . . . sub-assemblies and completed assemblies . . . loads out shipments. In addition, it efficiently augments the yard crane . . . Says Mr. F. A. Jones: "We find the ROSS exceptionally valuable in that we can now store shorter-length materials in our general storage yard. This releases space under the crane for the extremely long structurals and bars which the crane handles."

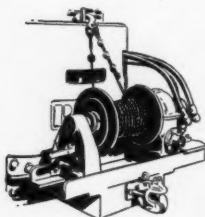
Investigate ROSS Lift Trucks (capacities 5,000 to 18,000 lbs.) for your plant . . . find out how they can become vital links in your materials-handling system . . . it will pay you.



**ROSS CARRIERS** . . . Speed transportation of long materials and unit-loads. Capacities, 10,000 to 30,000 lbs.

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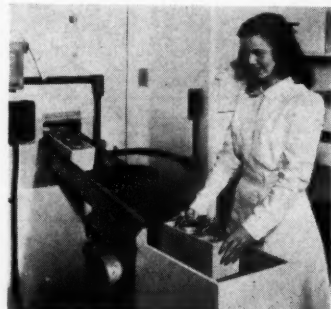
Adds to versatility of ROSS Lift Trucks. Permits faster, easier spotting of railroad cars, moving of machinery, skidding of heavy loads. Fits all models.



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**ROSS**

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280 Miller Street, Benton Harbor, Michigan, U.S.A.  
Direct Factory Branches and Distributors Throughout the World

phase of hospital service. Dr. Hayward R. Hamrick, Medical Director, stated



that the installation more than paid for itself in the first three months of operation.—Courtesy, Goodall Rubber Co., Trenton.

**RACKS ELIMINATE CONGESTION**—These two photographs illustrate how A. R. Barnes & Co., a Chicago printer, eliminated the storage headaches which confront most publishing, printing and paper houses faced with warehouse space shortages.

Here were the problems: (1) Storing miscellaneous sizes and kinds of printing paper so they would be quickly available for the presses; (2) Storing customers' printed forms, to be ordered out as needed; (3) Conserving limited space for traffic and other purposes.

The double layer pallet racks shown

## The Most Economical Pallet Buy on the Market Today!

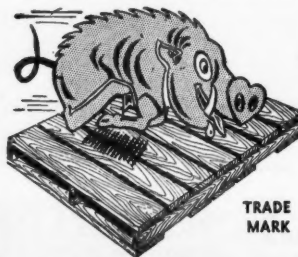
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Brand  
**PALLETS**

Engineered to your own particular specifications in the largest, most modern pallet plant in the country. Our long experience is yours to solve materials handling problems.

Representatives in principal cities. Contact them or write us direct.

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Plant and Sales Office in  
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here solved the problems this printer faced for years. Officials report that



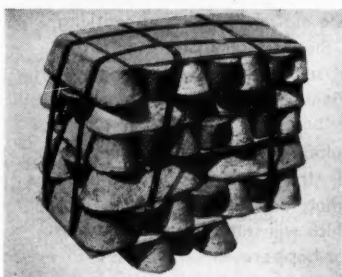
the paper is neatly stored and accessible for use on the presses. The printed



forms are stored on the second level, segregated for quick handling and shipping. Valuable floor space this paper once occupied is now used for traffic and other operations.—*Courtesy, Uni-strut Products Co., Chicago.*

**UNITIZED BRASS INGOTS** — A new method of packing and shipping brass ingots which reduces shipping, handling and storage costs has been developed by the Samuel Greenfield Company, Inc., Buffalo smelters and refiners. The method—exclusive with Greenfield—entails the packing and shipment and storage of ingots in unit disposable pallets.

Ingots shipped in UNIT-PAKS are said to be loaded, unloaded, handled



and stored at a fraction of the cost of those shipped loose. The load units are quickly, easily and inexpensively handled by light manual or automatic handling equipment, such as fork trucks, 2-wheel trucks, grab hooks, etc. Stored in units, they make sight inventories possible, occupy less storage space. 13,600 pounds of brass ingots can be safely stacked in UNIT-PAKS in a space less than 2 feet wide, 4 feet deep and 8 feet high.

Freight costs are also said to be

# UP

goes  
material-handling  
efficiency

when you use Battery Industrial Trucks

**G**reater efficiency in material handling means greater earning power in any plant. Start paring unnecessary moves for production hands or warehouse men and you not only reduce handling cost per unit, but make way for volume never before possible.

Battery industrial trucks are the dependable, economic means of obtaining such efficiency. They can perform their strenuous tasks 24 hours a day every day if required, and their power characteristics are outstanding: instant starting; quiet operation; no fumes; no power used during stops. Driven by electric motors, they have a minimum of wearing parts and are inherently trouble-free.

Keeping these hard-working trucks on the job calls for EDISON Nickel-Iron-Alkaline Batteries. Built of rugged steel, yet precise as a watch, they are recognized for dependability, long life and trouble-free operation. Specify EDISON and you specify maximum reliability—enduring quality.

**ADVANTAGES OF EDISON NICKEL-IRON-ALKALINE BATTERIES:**  
They're mechanically durable; electrically foolproof; quickly and easily charged; simple to maintain; not injured by standing idle.

Thomas A. Edison

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**STANDARD MODELS  
MEET OVER 90% OF  
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## THE REPEATED CHOICE of LEADERS in the HEAVY INDUSTRIES

For many successive years, Euclid Cranes have fulfilled the most rigid material handling requirements of long established heavy industries.

Proved performance with long trouble-free service has resulted in standardization and repeat orders. 1/2 to 100 tons capacity. Spans up to 100 ft. Write for literature.

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lower. The conventional method of shipping brass ingots in drums necessitates an increase of 45 pounds in shipping weight (tare weight of drum) for each 1500 pounds of ingots. The unitized method adds less than six lbs. to the same weight of ingots. The consignee is also saved the additional expense of the drum itself. Improved safety is given as another benefit. The size and weight of the bundles is varied to meet the requirements of consignees. — *Courtesy, Samuel Greenfield Co., Inc., Buffalo.*

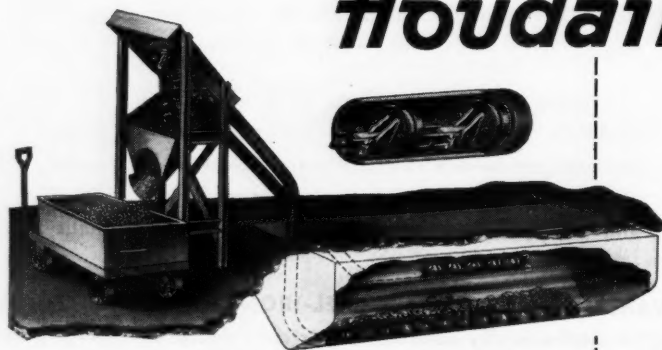
**TRACTOR DELIVERS TRACK-  
LESS TRAM**—With absence of electric lines preventing delivery of a new



trackless tram or trolley bus by its own power, BMS Ltd., of Johannesburg, Union of South Africa, found a simple, economical solution in the use of this industrial towing tractor. The tractor easily hauls the tram, weighing 23,000

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### — HERE ARE A FEW OF THE SUGGESTED USES FOR THE HOUDAILLE CONVEYOR —

#### METAL WORKING INDUSTRY

Cast Iron Dust and Chips  
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MANY OTHERS

Originally designed to handle sludge and waste matter in the metal working industry, the Houdaille Conveyor is being used to handle a wide range of applications in the materials handling field.

This automatic loading and continuous materials transport is adaptable to transporting any solid or fibrous material which will settle to the bottom of a tank or hopper.

If you have a materials transporting problem, write to 100 Wabash Avenue, Lebanon, Indiana in care of

**HONAN-CRANE CORPORATION**  
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The *Houdaille*\* CONVEYOR

\*Pronounced Hoo 'dye



pounds, several miles from the BMS factory to the Johannesburg Municipal shed when deliveries are required. At other times it performs hauling duties of many kinds.—*Courtesy, Clark Equipment Company, Industrial Truck Division, Battle Creek.*

**ELECTRIC HOIST MANIPULATES FREIGHT ELEVATOR**—The Moloney Electric Co., St. Louis, uses an electric hoist to operate a home-made freight lift, which transports components to and from mezzanine storage. The carrier is constructed of sheet metal sides and bottom, secured to channel-and-angle frames. It is guided by upright angles extending



from the ceiling of the balcony to the ground floor. Lugs, welded to the elevator sides, keep it in correct vertical alignment. A fence-wire guard and iron-pipe gate surround the balcony floor opening. Lifting and lowering is accomplished by a hoist, permanently mounted to a building girder. The wire rope hoist-cable is threaded through pulleys to direct the vertical motion of the elevator. Upper and lower limit switches automatically stop the elevator at the lower and upper floor levels.—*Courtesy, Yale & Towne Mfg. Co.*

**GRAIN IN BOXES**—Handling grain in 7½ ton boxes by fork lift truck rather than in 100 pound sacks by hand is paying off for Glenn Quick, operator-owner of the Quick Seed and Feed Company of Phoenix, Arizona.

The company handles approximately 25,000 tons of grain and sorghum seed annually. Packaged in 100 pound bags, 25,000 tons adds up to a lot of sacks. Keeping seed segregated through each of the many processing operations is no small chore.

A few months ago Mr. Quick decided to invest in a 15,000 pound capacity fork lift truck and 300 specially constructed grain boxes to take care of this handling problem. Six months of

operation by this new method indicate that annual savings will be in the neigh-



borhood of \$25,000. Loading, unload-

ing, handling and storing have been greatly simplified. Waste and spoilage have been measurably reduced.

Boxes are five feet wide, ten feet long and six feet high and are constructed of 1 x 10 pine on 2 x 10 and 2 x 12 frame. Steel strapping and tie rods aid in withstanding the large pressure that free flowing seed can build up against a side wall. A sliding panel in one end at the bottom is used to empty the box, which is hoisted to an inclined platform with the lift truck. The box interior is lined with car liner waterproof paper, stapled to the sides and bottom.

Recently one man and the lift truck handled 30 boxes in 3½ hours. The



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Make us **PROVE** this conveyor  
can **CUT COSTS** as it  
**SPEEDS PRODUCTION**



## STEEL-PARTS STEEL BELT CONVEYORS

Yes, we stand ready to present positive proof that conveyORIZED handling with Steel-Parts STEEL BELT Conveyor will slash costs—step-up production. Mr. H. W. Ziegler, Factory Supt., at the Ed Roos Co., reports efficiency up 30% . . . unit cost down 10% . . . machine capacities increased 65%! And that's only one among dozens of reports testifying to the amazing results obtained with durable, rugged

all-steel conveyors, pre-engineered at the factory for your specific job. Let Steel-Parts engineers make recommendations to increase the efficiency of your materials handling methods. Mail the coupon below . . . today.

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Please send me complete information including engineering data and specifications on your Steel-Belt Conveyors.

Please have your representative call to discuss our specific materials handling problems.

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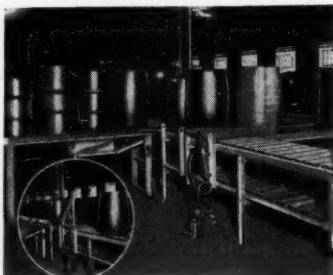


equivalent in grain sacks would have been 100 man hours.—**Courtesy, Hyster Co., Portland.**

**DRUM PROBLEM SOLVED**—An ingenious completely co-ordinated system combining apron conveyors, gravity roller and live roller conveyors and a system of automatic air-actuated deflectors, recently developed, has now solved the drum and barrel handling problems of a large petroleum products manufacturer.

The drums from each of several filling points proceed down the gravity roller conveyors, similar to the one shown in the small view. An automatic brake and an end-stop control the re-

lease of the drums from the gravity roller conveyor onto the main apron



conveyor line. Flow of the drums along the main apron conveyor is further controlled by the automatic, air-actuated

deflectors, which direct selected drums off the apron conveyor and onto the proper gravity roller spur to storage.

A typical operation is shown in the larger photograph. Drums are temporarily halted on the filling line at the left while drums from another filling line are being deflected onto the proper spur to storage. The inset shows one of the air-actuated deflectors raising to allow drums to flow along the main apron conveyor to other storage points. A chain-driven live roller conveyor, paralleling the apron conveyor, connects all of the storage spurs and delivers the drums to shipping.—**Courtesy, The Alvey-Ferguson Co., Cincinnati.**

# "POWER-PACK"

## The EXPENDABLE PALLET

### ...causing a REVOLUTION

**POWER PACKS** are revolutionizing materials handling—and no wonder! These new fibreboard pallets are so light, and so low in cost they may be discarded after one trip. Sturdy and strong, each post alone will support over 3,000 lbs.! With **POWER-PACK** palletizing of unit loads, labor savings of 55 to 75 per cent are possible. For extra freight savings **POWER-PACKS** are made near you by licensed container manufacturers. Send coupon today for detailed information.

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Robert Gair Co., Inc.  
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—New York, Chicago, Trenton, Savannah  
The Ottawa River Paper Co.  
—Toledo, O., Flint, Mich.  
The Corrugated Container Co.—Columbus, O.  
Cleveland Corr. Box Co.—Cleveland, Ohio  
Canton Corr. Box Co.—Canton, Ohio  
Hunt-Crawford Co.—Coshocton, Ohio  
Albany Corr. Cont. Corp.—Cohoes, N. Y.  
Niagara Corr. Container Co.—Buffalo, N. Y.  
Dubuque Cont. Co.—Dubuque, Ia.  
Western N. Y. Cont. Corp.—Lockport, N. Y.  
A. B. C. Box Co.—Minneapolis, Minn.  
Des Moines Cont. Co.—Des Moines, Ia.  
Ottumwa Shipping Containers—Ottumwa, Ia.  
Iowa Fibre Box Co.—Keokuk, Ia.  
South West Box Co.—Sand Springs, Okla.  
Arkansas Box Co.—Fort Smith, Arkansas  
Southwest Corr. Box Co.—Fort Worth, Texas  
Midland Container Corp.—Milwaukee, Wis.  
Industrial Container & Paper Corp.  
—Chicago, Ill.  
Central Fibre Products Co.  
—Quincy, Ill., Hutchinson, Kansas  
C. F. Downey Box Co.—N. Kansas City, Mo.  
Inland Paper Box Co.—Denver, Col.  
Pomeroy Mfg. Co.—Vincennes, Ind.  
Western Paper Products Co.  
—Salt Lake City, Utah  
The Eastern Box Co.—Baltimore, Md.  
Ohio Boxboard Co.—Rittman, Ohio



FILL IN COUPON AND MAIL TO NEAREST LICENSEE

CO. NAME \_\_\_\_\_

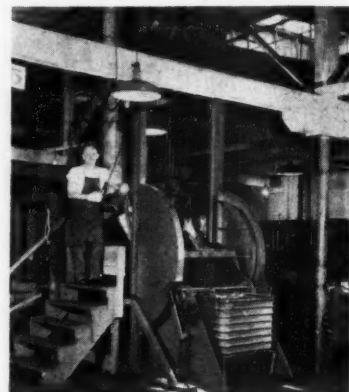
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CITY \_\_\_\_\_

STATE \_\_\_\_\_

YOUR TITLE \_\_\_\_\_

**ADDISON-SEMME'S CORP., Racine, Wis.**  
Patent No. 2432295



washer. Formerly, material was fed into the hopper by hand. The skid is placed into position by a fork truck. A cross bar (which may be adjusted to various heights to accommodate different sized boxes) holds the container during dumping. Tilting starts as soon



as the load is lifted in order to reduce shock; dumping is done by an operator, who controls an electric hoist which supplies the lifting power. It is stated that the improved method of feeding resulted in doubling the output of the metal parts washer.—**Courtesy, Mansaver Industries, Inc.**

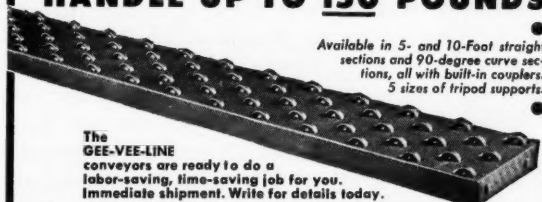
# Really Portable!



## WEIGH ONLY 26 POUNDS

Designed to meet the demand for flexibility-in-use as a materials handling aid... indoors, outdoors, on assembly line or delivery line... in factory, warehouse, store or trucking fleet. No need to pamper them—they're tough and practically maintenance proof. Standard 10-foot sections WEIGH ONLY 26 POUNDS and

## HANDLE UP TO 150 POUNDS



The GEE-VEE-LINE conveyors are ready to do a labor-saving, time-saving job for you. Immediate shipment. Write for details today.

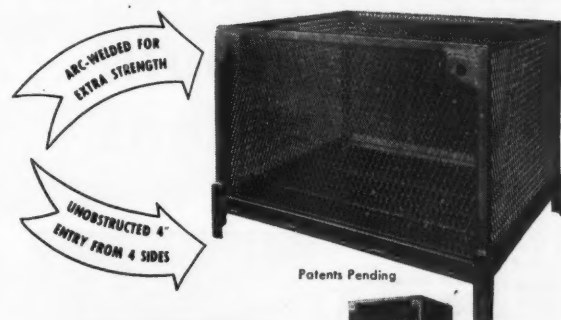
HASLETT CHUTE AND CONVEYOR CO., OAKS, PA.

Available in 5- and 10-Foot straight sections and 90-degree curve sections, all with built-in couplers. 5 sizes of tripod supports.

**NOW**... a handling, storing, and shipping box that's so superior, we invite you to watch it save you money in your own plant

*The New Heavy Duty*

# PACO TRANS-A-BOX



Patents Pending

## FEATURES

### EASY TO STACK

The patented frame locks the boxes in place.

### STURDY

Designed so that stress is applied to the frame and not the screen. Longer life is assured.

### EASY TO COLLAPSE

By releasing only two locking pins, the box is ready to fold, easily. No tools required.

### FOLDS TO 25% OF BULK

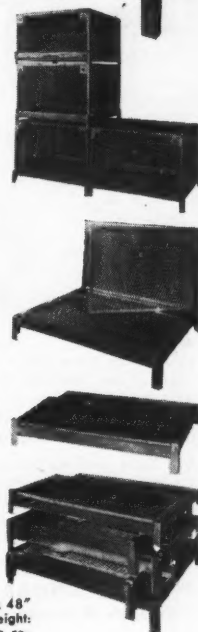
Meets tariff laws for return of boxes at minimum cost.

### STORING IS EASY

When folded, the pat'd frame permits storing in small space.

### REQUIRES NO LINERS

Small openings in the mesh mean small objects stay in.



SPECIFICATIONS—40" wide x 48" long x 29" deep. Overall Height: 34". Entry 4". Other sizes as required. Finish: Aluminum Painted. Net Weight 174 lbs.

Send for informative Folder "Is Somebody Swiping Your Profits?"

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**RODUCTION ACCESSORIES Co.**

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AGENTS: CHOICE TERRITORIES STILL OPEN—WRITE TODAY



KRANE KAR swings loads to either side

**KRANE KAR**  
DOES 101 JOBS AT  
WEIRTON STEEL

KRANE KAR handles spare blooms for Blooming Mill, large slabs for Rolling Mill, charge boxes in Open Hearth, bars in Cold Drawn Bar Mill (finally loads them into railroad cars), changes rolls and bumper plates in Steel Strip Mill, and stands by to relieve heavy duty overhead cranes; transports all kinds of loads in Machine Shop, Construction and Maintenance Depts. With clamshell bucket, KRANE KAR moves sand in Welding and Foundry Depts., and coke in Coke Dept. Ask for illustrated Bulletin 89—"How Metalworking Plants Reduce Materials Handling Costs."

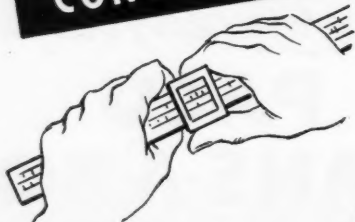
Gas or diesel, 12 to 37 ft. booms or adjustable telescopic booms; solid or pneumatic rubber tires, 1½, 2½, 5 and 10 ton cap. Buckets, magnets, and other accessories available.

THE ORIGINAL SWING BOOM MOBILE CRANE WITH FRONT-WHEEL DRIVE AND REAR-WHEEL STEER

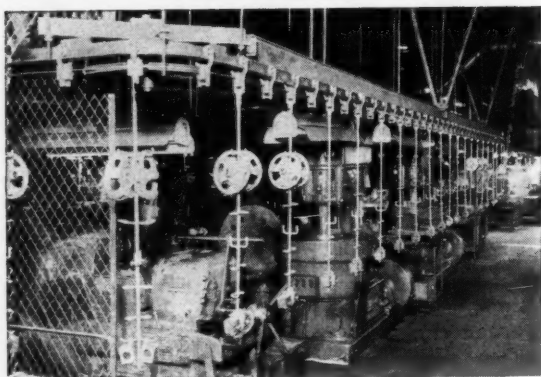
**SILENT HOIST & CRANE Co.**

888 63rd STREET, BROOKLYN 20, N. Y.

# Buschman TROLLEY CONVEYORS



## Custom-built installations at "ready made" prices



● Modernize . . . mechanize your production with Buschman Universal Cable Trolley Conveyors. Stock units at low cost can be adapted to your special needs with no disruption of production or present facilities. Easily installed from standard sections . . . completely field-bolted . . . require no welding.

For light and medium loads Cable Trolley Conveyors by Buschman are efficient, durable and far less costly than conventional chain conveyors. Buschman Engineers will gladly show you—at no cost—how the Universal Cable Trolley Conveyor can be "tailored" to your needs.

### STANDARD STOCK UNITS

*Smooth Running, Trouble Free Installations*

- 3" T. J.R. Track
- Double Duty Trolleys on Steel Cable
- Timken Bearinged Idler Sheaves
- Variable Speed Drive
- Vertical "S" Curve
- Take Up Units

For full details, write for Bulletin 40.

## Buschman Conveyors

THE E. W. BUSCHMAN COMPANY, INC.  
Winton Place, Cincinnati 32, Ohio

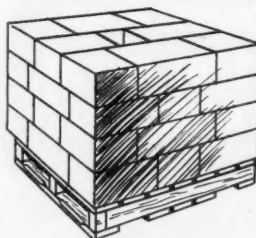
## ON THE PALLET . . .

(Continued from page 30)

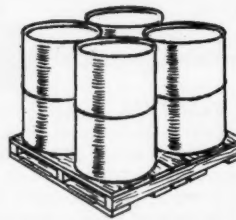
tory, glass batch and all raw materials going into it will be carried by low pressure aid. Jackson Brothers previously made a successful trial of the system in another plant.

**C**RANE operation isn't profitable unless the crane is actually operating. If the operator gets tired toward the end of the day, you are losing the value not only of his time but also the machine he is operating. The comfort of the man in charge of a \$300,000 machine certainly merits attention. Optimum visibility has always been an objective, especially on outdoor cranes. We decided that an operator would be more comfortable if he were sitting down rather than standing up. When the operator sits down then the problem of vision becomes more significant. Recent trends in improving the conditions for the operator have resulted in the following: changing the front of the cab circular; protecting the bottom of the cab with a heavy channel to reduce the dangers from swinging loads; enclosing and air conditioning the cab from severe weather conditions; and providing arrangements enabling the operator to run the crane while sitting whenever possible.—Excerpted from a talk by E. C. Rice, vice president, Whiting Corp.

## WHEN YOU NEED PALLETS



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For better, more economical service, IPCO has mills strategically located in the East . . . New England, New York, Pennsylvania, and Virginia . . . promptly servicing orders for hardwood and expendable pallets. Send your specifications today for prompt quotation.

IPCO is licensed to make the new 4-way pallet under U. S. Pat. No. 2369944.

Brochure on request. Ask for name of representative in your area.



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PALLETS EXCLUSIVELY SINCE 1941

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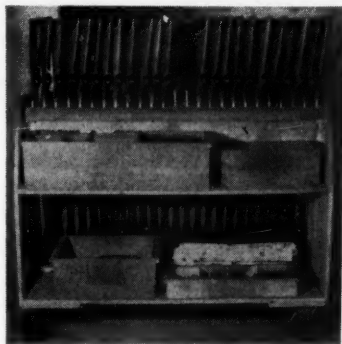
## SHOTGUN ASSEMBLY . . .

(Continued from page 37)

sembly line. A full-time storekeeper was put in charge of this storeroom and it is his responsibility to deliver gun parts to the assembly line as needed and to verify all receipts and requisitions.

The castered hand trucks were redesigned so that they would not only transport finished guns but also hold all the parts necessary for the assembly of guns. As shown in the photographs, the Barrel-Receiver Assembly is placed on the left side of the truck, in the same space used for the finished guns. On shelves accessible from the right side of the truck are placed parts trays so designed that on one trip each assembler can take all the parts needed to complete any one of the present three operations on 25 guns. The stock assemblies are placed on wood dowels on top of the truck so that they are within easy reach of the assembler.

The initiative for assembly orders is now a function of the Production Control Department. This department issues Factory Production Orders to the storekeeper in conformity with the latest revision of a Master Schedule originally



RIGHT SIDE of final assembly truck. Center, right—magazines for first operation. Lower shelf—parts for second operation. Center, left—parts for the third operation.

established at the beginning of the year by the Sales and Manufacturing Departments.

Whenever the storekeeper receives an assembly FPO he in-

structs the storeroom employees to prepare a certain number of a particular gun for the final assembly line. These employees take an empty truck to a section of the Barrel Assembly and Receiver Assembly racks which contain the required Model gauge and length. A barrel and receiver are selected and the barrel is assembled by a quarter turn to the receiver having the same serial number. The two parts are then placed on the truck as shown. Next, the stock assem-

lies are placed on top of the truck so that they will be directly behind the correspondingly numbered barrel and receiver. Finally enough interchangeable parts for 25 guns are added to the parts trays and the truck is then delivered to the final assembly line by the storeroom employee from the south end of the storeroom.

### Castered Trucks Meet All Needs

On the line the first operation is to assemble and straighten the

## STREATOR DEPENDABLE *Corrugated* Materials Handling Products



- PALLETS
- SKIDS
- BOXES
- RINGS
- RACKS
- CARTS
- TRAILERS
- SPECIAL EQUIPMENT

Write for  
literature on  
complete line

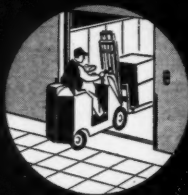
### Added Strength — Less Weight — Lower Cost

Corrugated material handling equipment lasts longer and reduces maintenance and replacement costs. It is safer to use because it is stronger. The corrugations act as reinforcing ribs, more than doubling the strength and rigidity of the units—at the same time eliminating needless weight and bulk. The result is vastly improved handling equipment that takes more abuse, gives added years of service and COSTS LESS.

STREATOR DEPENDABLE is completely equipped to manufacture corrugated handling equipment to your specifications. Also full line of standard units at surprisingly low prices. Write for full details, literature. State your needs.







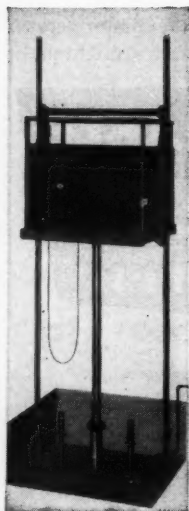
## Using Power Vehicles for Elevator Loading?

**That calls for an elevator with rugged construction and accurate landing stops**

Oildraulic Elevators work perfectly with material handling methods in use today. Even with heaviest loads they operate smoothly and stop at floor landings accurately. Every Oildraulic is built to take hard wear . . . ruggedly constructed.

### FOR 2, 3 OR 4-STORY SERVICE

Other advantages: Requires no penthouse or heavy load-bearing shaftway structure—powerful hydraulic jack pushes load up from below. Compact electric power unit can be placed in waste space. Gives lowest cost operation on rises up to 40 ft. Car sizes and capacities as required. All popular controls. Write **ROTARY LIFT CO.**, 1010 Kansas, Memphis 2, Tenn., for catalog RE-304.



**Rotary**  
**OILDRAULIC ELEVATORS**  
The Elevator That's PUSHED Up



**FIRST STEP TO PRODUCTION ECONOMY**

Here's a C-F Lifter, working with a mobile crane, unloading a car of steel in record time. C-F Lifters can pick up, carry and unload more tonnage per hour, using less man and crane time than any other method because they are designed for economical operation.

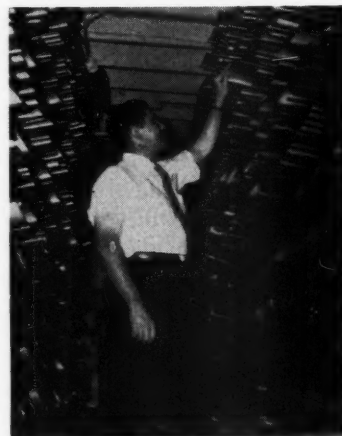
One man operation of a C-F Lifter means lower labor cost—wide carrying angles and tong action mean safer carrying—split-second opening and closing adjustments of the Lifter jaws to handle varying sheet widths assure speedy handling—add them all up and you have economical materials handling with a C-F Lifter.

If you can handle or use sheet metal, a C-F Lifter can reduce your costs the first day it goes to work for you. Ask for the Bulletin "C-F Lifters"—it details the advantages and economies of these superior sheet handling machines.

**CULLEN-FRIESTEDT CO.**  
1320 S. Kilbourn Ave., Chicago 23, Ill.



magazine, which is done by one man part-time. He places the tray of magazines on his work bench,



**EFFICIENT STORAGE RACKS** for stock assemblies. The author is shown here making a selection.

gets a receiver from the truck, assembles and straightens the magazine and returns the assembly to the truck. He then pushes the truck about five feet to the next operator.

Two men, full time, complete the assembly in front of the receiver by assembling the slide handle, yoke, magazine spring cup, magazine spring, and magazine nut. Whenever a truckload is completed

**IN SEVEN MINUTES**—A flatbottomed highway truck moves into one of the loading/unloading bays in the midtown building of The Manhattan Storage & Warehouse Company, New York City, carrying an overseas packing case weighing some 4,000-lbs. Powered fork trucks work from each side of the highway truck's bed, lift the case and permit the highway truck to move out.



The entire operation, utilizing the fork trucks, takes six to seven minutes.—Courtesy, Electric Industrial Truck Association.

it is pushed to one of the next four operators.

The last operation by these four men is to complete and adjust the assembly inside the receiver and assemble the stock.

When an operator completes a truck of finished guns the foreman inspects each gun and transfers it to a smaller size truck, which will fit the elevator. This truck delivers the guns to the range for function testing and targeting. The empty assembly truck is now at the north end of the storeroom, ready to start another journey south to the beginning of the assembly line.

Damaged parts are returned to the storeroom by the checker on the line in order to be able to requisition additional parts against the particular FPO. The damaged part is reworked or scrapped and charged to that order number.

**OVER-UNDER SCALES** are extensively used in the packaging department at National Screw & Mfg. Co., Cleveland. For rapid filling of boxes with a particular number of pieces, a master count is placed in a container on the platform nearest scale indicator.



For packaging exact duplicates of the master package, the operator scoops up a quantity of screws in the box and places it on the front platform of the scale. Accurate count in successive packages is assured when the indicator stops at center showing a balance between the two platforms.

**216 BARRELS INSTEAD OF 80—** When it is necessary to store barrels of processed poultry at the Supreme Quality Cut-Up Poultry plant of Grimes & Hauer, Fredericksburg, Pa., after the delivery trucks have left to make deliveries, this powered fork truck places them in this cold-room. Ability of the truck to raise the barrels has made full capacity of the room available. Some



216 barrels can be stored here through this mechanized means, as against only a possible 80 under manual methods.—*Courtesy, Electric Industrial Truck Association.*

Lifting and loading materials, parts, etc. . . . clean-up and maintenance work . . . drawbar work such as moving machinery, cars.

# Inside

# Outside

## ALL THE YEAR AROUND . . .

**Interchangeable Attachments**  
**Make the ALLIS-CHALMERS**  
**HD-5G and TRACTO-SHOVEL**

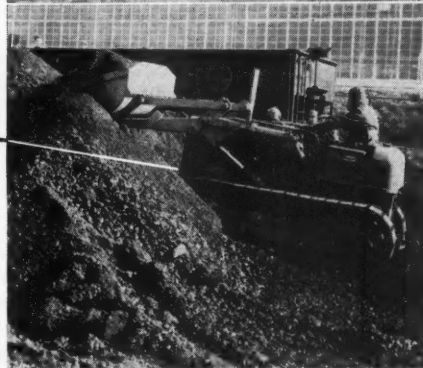
**a Versatile, Money Saving, All-Season Producer**

Here is a material handling outfit that can't be beat on many jobs, either inside or outside of industrial plants. Handling bulk . . . stockpiling . . . feeding hoppers . . . plus dozens of dozer and bucket jobs make the HD-5G Diesel Tractor with Tracto-Shovel an invaluable, ever-busy investment in speeding up your operation, cutting down your costs.

Tractor weight 11,250 lb., 40.26 drawbar hp., 50.25 belt hp.

**ALLIS-CHALMERS**  
TRACTOR DIVISION • MILWAUKEE 1, U. S. A.

Have you ordered your 1949-50 DIRECTORY yet? Many improvements have been incorporated in the new, revised edition. Copies are available at \$5.00 each. It will pay you to order one for your purchasing agent, engineers, and executives and supervisors in charge of production.



Maintaining grounds and parking areas . . . bulldozer work . . . excavation . . . snow removal . . . load and unload bulk . . . stockpiling . . . spotting cars.

### ATTACHMENTS

- 1 Cu. Yd. Standard Bucket
- ¾ Cu. Yd. Narrow Bucket
- 2 Cu. Yd. Light Materials Bucket
- 1 Cu. Yd. Rock Bucket
- 1 Cu. Yd. Magnesium Bucket
- Drag Bucket
- Teeth For All Buckets
- Heavy Duty Bulldozer Blades
- V-Type Snowplow

• • •  
Allis-Chalmers builds a wide line of wheel and crawler tractors for material handling of all kinds — loading, carrying, pulling. See your Allis-Chalmers tractor dealer or write for literature.

# Special-Purpose SYSTEMS

designed to meet individual  
requirements, including:

## CONVEYORS

## PNEUMATIC TUBE SYSTEMS

## BLOWERS AND EXHAUSTERS

## AUTOMATIC PALLET LOADERS

## INDUSTRIAL VACUUM CLEANING SYSTEMS

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Lamson Corporation puts at your service expert consulting, engineering and installation service based on broad research and experience in thousands of comparable installations.

Frequently standard systems, modified in only minor details, are adequate to handle complex jobs. Others are designed from the floor up.

Write for descriptive bulletins on any of the above equipment. A wire or letter will bring a technically-trained field man for consultation.

# LAMSON CORPORATION

1300 LAMSON STREET SYRACUSE, NEW YORK

Branch Offices in Principal Cities

## ERIE WHEEL SHOP . . .

(Continued from page 26)

means of the jib hoists. Their take-off points are near the center of the shop, which in turn is close to the assembly rack along the south wall—the final destination of these axles.

This particular layout provides the shortest possible travel distances for the fork lift truck which picks off the finished axles for delivery to assembly. The use of the gravity racks offers another advantage, since the material advances by its own weight. In this way flow and intermediate storage procedures have been greatly simplified. A wooden wedge is inserted under the axles, as on the scrap track, whenever the advance is to be blocked.

For handling new wheels, which are moved four at a time in an upright position, the forks have been notched. The notches coincide with the flanges, thus serving as retainers. A clamp is lowered over the load during transit as a safety measure.

### Wheels Meet Axles

The assembly rack (No. 4) completes the U-shaped layout. It is likewise of the gravity type, and the axles delivered by the fork lift truck roll ahead to the far end, where assembly takes place.

In the meantime, the wheels for these axles have been taped (measured) and held for mates. Mated pairs are wheeled by the previously mentioned hand trucks to the boring mills, one located on each side of Rack No. 4, for re-boring.

(Steel wheels, it should be noted in passing, are seldom demounted from the axles. They are usually sent in for reconditioning of worn flanges and cut journals. The machine tools for this purpose—wheel lathe, wheel grinder, and journal lathe—are located in a straight line along the east wall. These machines are served by three-ton hoists run-



ning on I-beam tracks which curve out to a roofed section in the storage yard. Besides serving these machines, these hoists also transfer the heavy wheel assemblies from one track to another in the yard as the need arises, thus making for a flexible operation. It is to be noted that the segregation of the mounted steel wheels at one end of the shop tends to (a) reduce travel distance substantially, (b) minimize handling and (c) avoid interference with the U-shaped flow of cast iron wheels.)

The cast iron wheels are spotted by two-wheel hand truck under a hoist of the boring mill, which is an integral part of this machine. Erie engineers converted these hoists from electric to pneumatic power. The pneumatic cylinder that was installed is just long enough to hoist the wheels from the truck to the bed of the machine. The same applies to lowering. Since the hoisting height is limited by the length of the cylinder, broken chains and damage to the machine are forestalled.

The lifting device is a ball with a link. The ball is dropped through the hub of the wheel and a bar is then slipped through the link. An air valve switch is thrown to raise the load to the bed of the machine. After the hub has been bored for accurate placement of the wheel seat on the axle, the load is raised and swung toward the side of the wheel chute, which parallels the assembly rack.

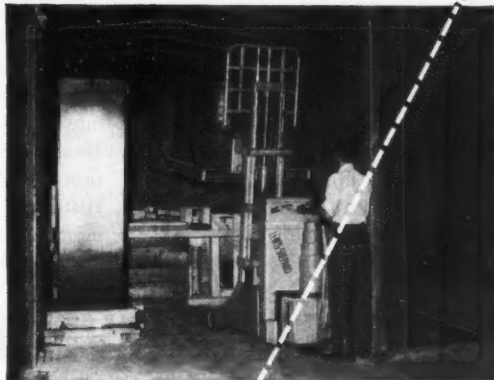
The wheel is lowered on a hinged apron, a  $\frac{3}{8}$ " steel plate, and the ball and link disengaged. The operator steps on a pneumatically actuated release lever, which raises the apron and places the wheel upright in the gravity trough.

An air-operated curved section at the end of the assembly rack serves as a stop for the axles. The wheels are rolled at this point onto track-bound dollies, the track being at right angles to the rack. The wheels are thus readily adjusted in relation to the axle. (White lead lubricant is applied to the wheel hub and the wheel seat.) As the

## "MASTER" LINE BUYING... IS STRAIGHT LINE THINKING

### SAVES YOU • MONEY

Floor Space  
Storage Space  
Ceiling Space  
Receiving Time  
Production Time  
Storage Time  
Maintenance Time  
Shipping Time  
and pays  
for itself  
in "Jig Time"



The JACKSTACKER — At a flick of a switch in the handle head this combined electric lift truck and stacker lifts and lowers as it hauls — fits in where heavy fork trucks fail. 5 different models, telescopic and non-telescopic. Caps. to 4000 lbs. Photo shows Counterbalanced, Tilting Model, 3000 lbs. cap. in freight car. Hundreds of other cost-cutting uses for this latest unit in the "MASTER" Line.

## LEWIS-SHEPARD<sup>®</sup> MATERIALS HANDLING EQUIPMENT

"Engineered to Save You Money"



Volume Off? Costs up? Competition Swift? What to do? . . . Lick them with the "Master" Line! Multiply your manpower, storage space, floor space! Speed up receiving, production, storing and shipping!

### CUT COSTS WITH The "MASTER" Line

SPACEMASTER Electric Trucks  
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(Fork Types)  
MASTER JACKSTACKERS  
JACKLIFT ELECTRIC Trucks  
MASTER JACKTRACTORS  
MASTER JACKLIFT Trucks  
MASTER QUICKLIFT Trucks  
MASTER REDILIFT Trucks  
MASTER SPEEDLIFT Trucks  
POWERMASTER Stackers  
SPEEDMASTER Stackers  
FLOORMASTER Trucks  
SHIPMASTER All-Steel  
2-Wheel Trucks  
WELDMASTER Platforms  
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OR WRITE US  
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Midwest Plant: Crawfordsville, Ind.  
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PLEASE SEND ME your  
new 16 page Bulletin on  
the two latest units in the  
"Master" Line.



dollies are rolled toward the rack from each side, the wheel bore is positioned on the wheel seat. The axle with the loosely attached wheels is released from the lifting section on the rack, and the unit is then rolled on the dollies into the mounting press. (The latter is served by an oil gear pump.) The dollies with the mounted wheels are then lined up with the outgoing track leading to the loading station in the yard. (See last month's article for a description of this part of

the layout and the provision made for uninterrupted unloading-loading of specially equipped flat cars. —Ed.)

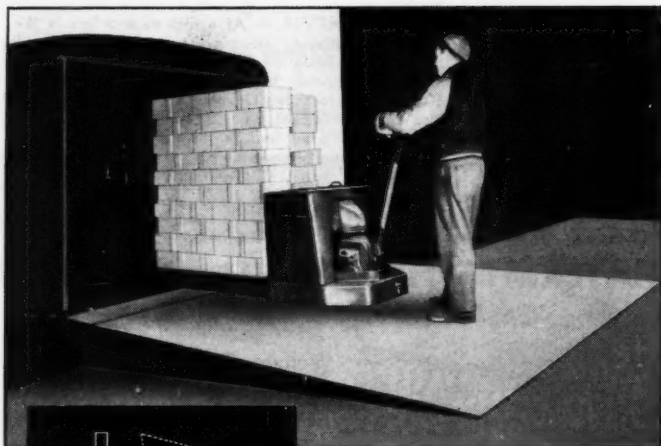
#### Six Important Operating Features

The present operation was moved from the Erie shops in Hornell, N. Y., to the present location in Meadville in January of 1948. At that time many refinements were incorporated into the system which had been planned for

some time. The move to Meadville was part of a general streamlining program. Meadville is near the dead center of the Erie's 999-mile-long main line between New York and Chicago, and thus the reconditioned wheels are transported the shortest distance possible to any point on the Erie system.

The new and improved operation gives us the following advantages, among others: 1. Automatic delivery of incoming cast iron wheels to the shop (via an automatic turntable). 2. Immediate disposal of scrap wheels and axles (at a maximum distance of 10 ft. beyond the demounting press). 3. The use of the automatic monorail dispatching system (for wheels) and mechanical disposal of axles is also important as a safety factor. 4. The U-shaped flow of axles to be reconditioned utilizes space along walls, leaving center areas free for other necessary production. This avoids congestion and confusion. 5. A handling device planned for each job—hoists, fork trucks, and gravity racks—minimize the factor of human effort to a negligible point. 6. The particular arrangement of the unloading-shipping function permits reloading of empty flat cars with utmost economy of yard crane operation and time consumed in spotting cars.

## GLOBE SELF-LEVELING RAMP



Hydraulic cylinder positions ramp to truck bed level. Ramp is then free to move up or down as truck springs flex.



### Cuts Loading Time

On your dock, this Globe Self-Leveling Ramp quickly pays for itself. Cycle of operation is shown in drawing. "Lip" of ramp is raised when truck backs to dock. Ramp then "rides" firmly on truck bed or tail gate, even when truck springs are depressed under load.

### Engineered to your needs

On nearly every type of materials—handling or processing, Globe Lifts . . . engineered to your exact needs . . . can help save you time and money. Our specialized staff of Lifting Engineers will gladly offer suggestions, without obligation. Tell us your problem and ask for Bulletin F949 showing typical industrial installations.

**GLOBE HOIST COMPANY**  
DES MOINES 6, IOWA PHILADELPHIA 18, PA.



Loading Lifts



Elevating Ramps



Industrial Truck Lifts



Production Lifts



Elevators



Sidewalk Lifts

## ON THE PALLET . . .

(Continued from page 46)

**C**ONSTRUCTION crews working on the Texas Gas Transmission Corporation's 800-mile Texas-to-Ohio natural gas pipe line have put approximately 200 miles of pipe in the ground, and are working on schedule on the 26-in. pipe line project. The corporation's executive vice president W. T. Stevenson said it is expected to have the pipe line in preliminary operation by the end of the year, in time to deliver natural gas to meet cold weather needs. The initial capacity of the new line at the end of this year is expected to reach 304,000,000 cu. ft. of gas a day. By the spring of 1950, upon completion of additional facilities, its capacity will reach 400,000,000 cu. ft. per day.

**K**ARAT Gold can now be rolled to a mirror finish and as thin as electroplate on any non-ferrous metal base through the development of the Inter-Weld Process by the Gold Filled Division of the American Silver Co., Inc. It is said that manufacturers of fountain pens, jewelry, novelties, cosmetic items, etc., will find this method a time saver over the conventional method of manufacturing from brass and then polishing and electroplating to achieve the desirable gold color. It is also reported that the finished product is actually improved in quality, since the rolled gold layer is tougher and longer wearing than a comparable thickness of gold electroplate.

**T**HE U. S. Air Force has distributed copies of its recently published "A Guide For Selling to the United States Air Force" to the seven field procurement offices of its Air Materiel Command in order to make the informational booklets readily available to small businessmen and manufacturers in areas served by the regional offices. It outlines the procedures which any organization with goods and services to sell to the USAF can follow to insure fair and impartial consideration in contract bidding. The pamphlet will be mailed to any businessman or manufacturer upon written request to any of the following regional procurement offices:

New York Air Force Procurement Field Office, 67 Broad St., New York 4, N. Y. Dayton Air Force Procurement Field Office, Wright-Patterson Air Force Base, Dayton, Ohio. Fort Worth Air Force Procurement Field Office, Government Aircraft Plant No. 4, Fort Worth 1, Texas. Detroit Air Force Procurement Field Office, West Warren and Lonyo Ave., Detroit 32, Mich. Chicago Air Force Procurement Field Office, 209 W. Jackson Blvd., Chicago 6, Ill. Boston Air Force Procurement Field Office, Boston Army Base, Boston 10, Mass. Los Angeles Air Force Procurement Field Office, 155 W. Washington Blvd., P. O. Box 3849, Terminal Annex, Los Angeles, Calif.

## 7 STAVES INTERLOCK

Each Super-Concrete Stave in a Neff & Fry Silo interlocks with six contiguous ones. The edges are grooved and beaded. The joints are so secure that grouting is not necessary, although a mastic filler is used when damp-proofing is specified.

Due to the diagonal joints, reinforcing rods impinge upon both ends of all staves. As many additional rods are drawn around the bodies of the staves as needed to resist lateral pressure.

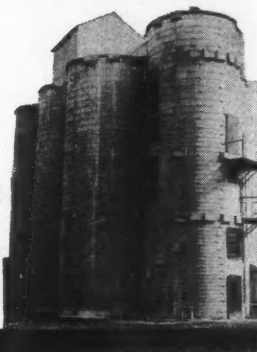
This patented design makes the N & F Silo a structure of distinctive strength and solidity. The corrosion-resistant materials assure long life with virtually no maintenance cost.

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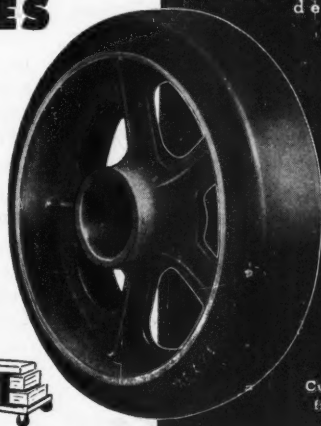


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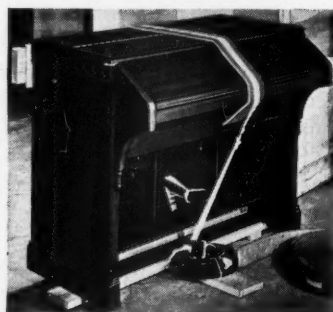
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Surface Protection. Chest of drawers.  
Photo courtesy of Coleman Furniture Company, Glen Rock, Pennsylvania.



Bracing. Hammond Organ. Photo courtesy of Hammond Instrument Co., Chicago, Ill.

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# PACKAGING MECHANICS SECTION

A regular monthly section in which are presented solutions to the problems of efficient filling and handling the boxes, cartons, bags, bottles, cases, etc., used in commerce and industry.

## C O N T E N T S

### **PRACTICAL Cushioning And The "Perfect" Package.**

Proper recognition of cushioning requirements goes a long way toward keeping packaging costs down. The author reviews the place of Bracing, Blocking, Flotation and Finish Protection, as well as other technicalities. A useful study.....

56

**WELDED TWIN PACKAGES**—a time-consuming job that has so far been done by hand is now performed by newly designed spotwelding machines in the filling line. Manufacturers of tinned products will be interested in knowing how this equipment was successfully applied at the S. C. Johnson & Son Co. for a faster and more economical packaging operation. 61



# Practical Cushioning

## *and the "perfect package"*

**"Lowest comprehensive cost," the four basic cushioning factors of Bracing, Blocking, Flotation and Finish Protection—these are some of the points clarified by the author.**

**I**N SELECTING cushioning materials, as well as the other ingredients of a shipping package, many package designers have an urge to produce the "perfect" package. Such a perfect package tendency, if not tempered by sensible economic considerations, puts the package designer in a new field in short order. The science of modern package design insists that the packaging engineer get rid of all frills, just as "gingerbread" has been abandoned in the fields of architecture and apparel design. Along with other phases of industrial production, *preparation and protection* of an item for distribution is being closely examined and double-checked. In progressive, wide-awake concerns, what is needed to do a job in the package will stay—other items will not.

### **"Lowest Comprehensive Cost"**

What comes closest to being a perfect package in modern thinking is one which will bring a product to its destination at the "*lowest comprehensive cost*." Comprehensive cost includes not only the direct charges for labor of assembling the package and the materials and ingredients going into it, but also such indirect items as good-will, reputation with the customer, service and repair charges on damaged merchandise, etc. When claims are paid by the carrier there still remain handling and service charges on the claims.

A recent survey indicated that for every complainant advising a company of damaged merchandise or dissatisfaction with the product, there were on the average 25 other

dissatisfied purchasers who did not report these facts but were disgruntled enough to stop buying the product. In analyzing the "comprehensive cost" of an industrial shipping package the loss of dollar returns due to dissatisfied customers should be weighted by a 25-to-1 or similar factor.

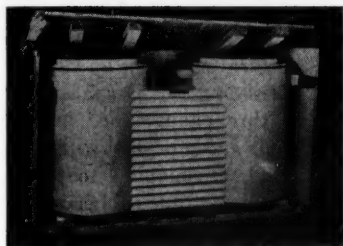
### **Percent of Package to Product**

Tangible or direct costs of the package can always be quickly assembled by a cost analyst—or, if preferred, by a capable shipping department representative. The cost of materials and labor expended on the package divided by the salable value of the goods packed, gives the ratio of "percent of package to product." This runs roughly from two to eight percent

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*(Adapted from a talk by S. L. Swenson, product engineer for the Kimberly-Clark Corp., delivered at the June meeting of the Michigan Division of the Society of Industrial Packaging and Material Handling Engineers, Detroit.)*

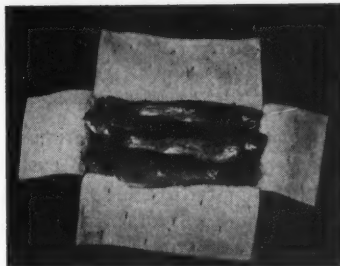
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**BRACING.** Deepfreeze Cabinet—Motor Products Corporation



**ABSORPTION.** Fowl Pox Vaccine—Cutter Laboratories



**INSULATION.** Rainbow Trout—Airbone Perishables, Inc.

in the majority of cases, probably averaging around five percent. Careful estimates of other "comprehensive factors" usually indicate that the true cost of a package may run five to ten percent higher than this. Design changes instituting different packaging methods, and involving slightly more money for improved package cushions, spacers, wrappers, etc., may result in an over-all, lower "comprehensive cost."

The theory and fundamentals underlying "comprehensive costs" apply to cushioning materials as well as to the broader package. In fact, the practical method of determining cushioning kind and quantity demands that all factors of product nature, fragility, cost, shipping distance, nature of carrier, etc., be carefully evaluated according to their importance—and preferably in dollar terms, if possible.

An estimate has it that in the

engineering design of packages, in 95 percent of the cases the quality and quantity of cushioning protection incorporated is specified by rule of thumb, or simply by guess.

#### "G" Factor

A complete, scientific analysis of a shipping package can be made if needed. Answers can be developed indicating the amount (thickness) of any one of a number of common cushioning materials required to do a particular job. This question can be answered with a fair degree of accuracy. However, some important facts about the product must be already known, or determined in numbers.

One all-important, hard-to-get numerical factor is called the "g" or "gravity" factor. This is the number of times the force of gravity which will break the item. In many cases it is called the "index

of fragility" of the product. Secondly, a packer must know or assume the maximum shock load which might be imposed on his product. Must it withstand a two-foot or a 20-foot fall to a concrete floor? Having (1) the "g" factor and (2) height of fall to which the product might be subjected at the designer's disposal, it is possible to refer to tabulated data in graph form and determine with reasonable accuracy the correct thickness of any one of a number of common cushioning materials to do the required cushioning job.

#### Four Basic Cushioning Functions

The need of a majority of present-day packers is for a more direct, practical knowledge of basic cushioning fundamentals, which can be applied to their problem. If the package designer recognizes his cushioning problem, and can cata-

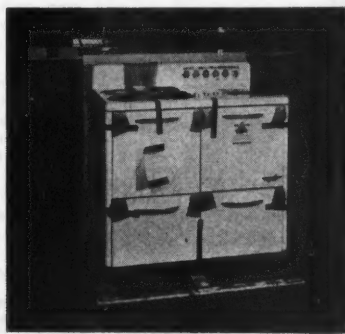
**FLOTATION.** Denture Mold—Kramer Dental Studio



**BLOCKING.** Coco-Cola Dispenser—Temp-rite Corporation



**FINISH PROTECTION.** Hotpoint Electric Range - Edison G. E. Appliance Co.



## PACKAGING MECHANICS SECTION

log it specifically, the application of the approximate quantity of cushioning becomes a formality.

All cushioning problems can be broken down into one or a combination of the following four basic categories: (1) Bracing, (2) Blocking, (3) Flotation, (4) Finish protection. A short resume of each one of these fundamental interior cushioning methods will illustrate the basic divisions of performance in the cushioning field.

### Bracing

This is a method of interior packing designed to prevent movement of contents within a container and to distribute the weight to all of its faces. This method uses cushioning materials in conjunction with wood bracing, metal strapping or corrugated fiberboard forms. The function of cushioning material is to

prevent scratching, press marking, burns, etc., by the coarse "holding" materials.

Cushions are applied in strip or pad form at bracing points only and usually range from  $\frac{1}{8}$ " to  $\frac{1}{2}$ " in thickness. The finish or texture of the product being "braced" determines the type of cushioning material specified. Products with coarse or with no special finishes can be padded under the bracing points with excelsior pads, corrugated fiberboard, macerated newsprint pads, etc., whereas highly finished products must be padded with finer cushioning material, such as hair felt, wood fiber felts, creped cellulose wadding, cotton blankets, etc.

### Blocking

Blocking is a method of wrapping irregularly shaped objects with soft, resilient cushioning materials to "block out" the voids. The resulting package is fairly regular in shape and comparatively easy to insert in the container. Excessive

stresses are avoided at projecting points, and the distribution of shock is facilitated by the cushion by transmitting the shock loading evenly throughout the article. Blocking is accomplished with soft, conformable cushioning materials such as felt, cotton, rubberized or curled animal hair, creped cellulose wadding, and wood fiber felts. Thickness of blocking materials ranges from  $\frac{1}{4}$ " up to 2".

### Flotation

As its name implies, it is a method of completely protecting the article in question from shock and vibration by wrapping or literally "floating" it in a thick cushioning material. "Flotation" packed products are literally *suspended* within the shipping package. The more resilient the cushioning material the better the performance. Cushions of especially designed materials, such as cotton, creped cellulose wadding, wood fiber felt, rubberized animal hair, in thicknesses of

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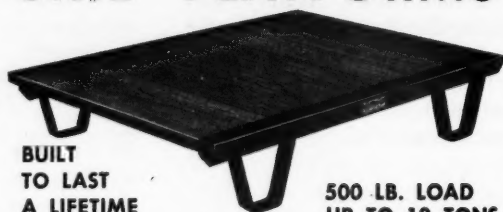


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## PACKAGING MECHANICS SECTION

1/2" to 3" make the most effective flotation packs.

### Finish Protection

This method involves the application of relatively thin cushioning materials to protect highly finished and delicate surfaces of wood, metals, plastics, or glass from damage by contact with other articles or other packaging materials which can cause abrasion or chemical action. In the event of infiltration into the package during transit of sand, dust, or cinders, the nature of these finish-protecting cushioning materials is such that the abrasive material works into the soft and protective cushion before it has a chance to scratch or mar the high finish of the product.

Usually comparatively large areas of the product (such as surfaces contacting corrugated spacers) are finish protected. Many

products cushioned by large quantities of coarse fiber blanket or dunnage material have finish protecting wraps applied beforehand to give necessary softness against the skin of the product. This prevents chafing, rubbing, burning action which dulls and mars the surfaces of many otherwise damage-free products.

Finish protecting mediums are usually considered to be those materials 1/8" or less in thickness which have proven that they can do a satisfactory job in this respect. Such materials as felted cotton and creped cellulose wadding do an outstanding job of finish protection. Some of the glazed and waxed kraft papers, properly secured to the product in question, are moderately successful in protecting delicate finishes. Many of the thicker cushioning pads and blankets such as wood fiber felts, creped cellulose wadding and cotton are, of course, perfectly satisfactory as a combination finish protecting and shock absorbing medium.

In correctly applied finish protecting applications the protective



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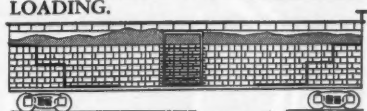
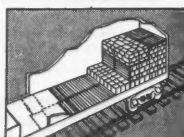
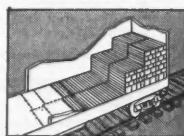
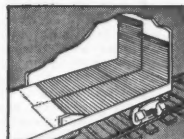
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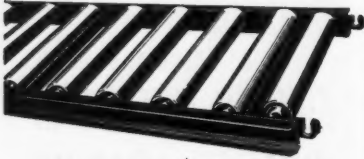
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**PACKAGING  
MECHANICS SECTION**

medium is tightly affixed to the merchandise. Any movement within the package (and in transit some shifting, vibratory, internal movement always occurs) must be relegated to those surfaces outside of, above, or away from the surface of the merchandise. This is the ideal treatment.

**Special Cushioning Methods**

Special functions, highly important in some packaging applications, are those of absorption and insulation. While not sufficiently comprehensive to be classified as basic cushioning methods, the "absorption" and "insulation" packs are assuming ever-growing importance.

An absorption pack is a specialized method of interior packaging designed to cushion the fragile con-

tainer of a liquid in shipment. The objectives are adequate protective cushioning against shock (wrap is usually by flotation pack method), plus rapid and thorough absorption of the liquid in case of breakage or leakage at the closure. Only a few cushioning materials possess the special properties required to do a creditable job of absorbent packaging—among these are creped cellulose wadding, absorbent cotton, and sawdust. These materials meet government regulations for parcel post shipment of liquids.

Insulation is rapidly becoming a quality much sought after by many shippers, particularly those packing and marketing cut flowers, frozen foods, fish, candy, medicines, etc. Much of the increased quantity of perishables being shipped by air and railway express is being cushioned wrapped by a material which is primarily a good insulator against extreme temperatures. The selection of the type of insulating cushion is often based on other characteristics which contribute to the satisfactory nature and over-all low cost of the pack. Considerations of low weight, flexibility and conformability, cleanliness, adaptability to packing techniques, etc., are highly important in the insulation of perishables and foodstuffs.

If the precepts as well as the cushioning processes can be kept simple enough, a lot more will be accomplished than if an attempt is made to overload shippers with technical and complicated determinations. Again, *correct recognition* of the type of cushioning problem, whether BRACING, BLOCKING, FLOTATION, or FINISH PROTECTION, means a good share of the cushioning battle won. With only a fair knowledge of cushioning materials, the average packaging engineer can be expected to select a reasonably appropriate material without too much difficulty.

Management readily recognizes the logic of a "comprehensive" look at the packaging end of the business since it is one of the best spots to reduce waste dollars and increase profit dollars.



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## Welded Twin Package

*The resistance welding industry develops a new type of spotwelding machine which meets a six-way packaging requirement in joining pairs of standard insecticide type cans. The joining rate is 160 cans per minute. Important economies are reported.*

S. C. JOHNSON & SON, INC., makers of Johnson's wax, sought a new method for joining "twinned" cans of an improved type of self-polishing wax, which were to be distributed on a large scale in a nationwide merchandising program. Methods available to the packaging industry for joining cans were not satisfactory. The company searched for a new method which would automatically join pairs of standard insecticide type cans at a high rate of speed, which could be synchronized with the rate of can filling, capping and the packaging production lines.

The pairs of cans had to be joined in such a way that the individual units would be attached firmly against the stresses of handling and shipment. The method of attachment had to permit the housewife to snap the cans apart easily, yet it could in no way soil or obscure lithographed container surfaces. Moreover, indications of metal tearing, can distortion and the possibility of leakage (after snapping apart) had to be avoided.

S. C. Johnson & Son engineers turned to the resistance welding industry for solution of the problem. A manufacturer of welders designed and built three spotwelding machines which automatically twin the cans at the rate of 160 units

per minute. Thus a solution was found for a problem of long standing in the packaging industry. It was difficult and costly to balance the old-time manual method with the high rate of speed of present-day filling and packaging machinery. The economies effected by the machine operation are said to be substantial.

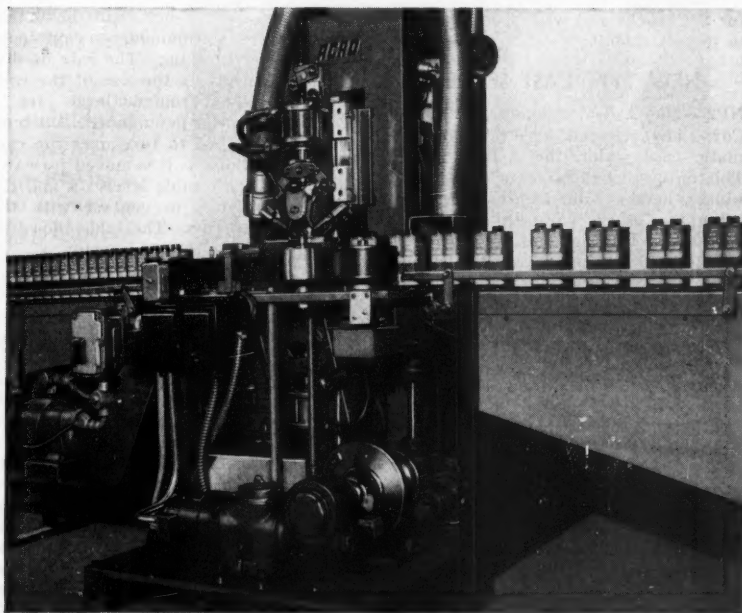
This type of welding machine is completely automatic and can be placed in the filling, capping and packaging production lines. It takes single cans from the standard feeding conveyor and puts paired cans back on the discharge conveyor.

A spot weld is produced at the

top rims and at the bottom rims of each pair of cans where the rims contact each other. The spot welds are accurately controlled by electronic weld sequence controls. While they hold against all stresses encountered in handling and shipment, each pair is snapped apart cleanly in the horizontal direction.

This new resistance welding technique will doubtless find wider application in the packaging industry, where manufacturers of tinned products have long been contending with the type of problem outlined in this description.

*(Data and exhibit used in this article were furnished by the Acro Welder Manufacturing Co., Milwaukee, Wis.)*



SINGLE CONTAINERS moving on the conveyor line (left of photo) emerge from this spotwelding machine (at right) as "twinned" packages, nucleus of a merchandising program. Three such welding machines paired millions of cans in few weeks.

# NEW

# PRODUCTS

For additional information on these products, write Dept. 5, Flow Magazine, 1240 Ontario St., Cleveland 13, or use postcard bound into this issue.

## SELF-DUMPING HOPPER

**NP1**—This self-dumping hopper, available from Roura Iron Works, Inc., is designed to permit one man to distribute and unload wet or dry, hot or cold bulky materials quickly and easily. The manufacturer claims a 50 per cent saving in time over manual emptying methods, based on 15 years of use in plants throughout the country. The operator lifts a release handle and the



hopper dumps, rights and locks itself. It is built to fit any standard type lift truck; the worker need not leave the truck to operate the hopper. The unit is made in 1/2, 3/4, 1, 1 1/2 and 2 cu. yd. sizes and is available to meet other specifications. It can also be designed for flat trucks and with special flanges to permit stacking.

## NEW TYPE CASE SEALER

**NP2**—The A-B-C Packaging Machine Corp. has released a new semi-automatic case sealer, the A-B-C Sealall. This unit will handle cases of different widths, heights, and lengths, one right after the other, with no adjustment necessary. The machine is designed to eliminate down time required to change from one size case to another. Speed ranges from one to five cases per minute. Use the card bound into this issue to get further information.



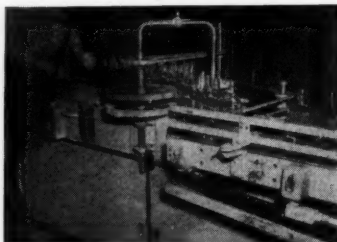
## SHORT-TURN FORK TRUCKS

**NP3**—For increased maneuverability and faster handling of materials in confined storage areas, the Industrial Truck Division of the Clark Equipment Co.

has developed special short-turn models of its battery-powered Clipper, Car-loader and Utilitrac. These models have capacities of 2000, 4000 and 7000 lbs., respectively. Standard models remain unchanged. Redesign of the trucks' battery compartments and counterweights to provide angled corners has reduced the turning radii by 6 1/2 ins. on the 2000-lb. truck, 6 1/4 ins. on the 4000-lb. truck and six ins. on the 7000-lb. truck.

## UNSCRAMBLING TABLE

**NP4**—The Island Equipment Corp. has introduced a straightline type of unscrambling table that is designed to unscramble most types and shapes of containers. A special flask discharge at-



tachment keeps flasks and jars moving to the discharge conveyor. Three conveyor belts traveling at three different speeds keep the containers moving in the direction of the discharge opening. The discharge V-belt can be interchanged to accommodate containers from a vial to a jug. The rate of discharge depends on the size of the container, running from 60 large jars to 240 small bottles per minute. A tilting table is designed to turn over the carton on the table as it is moved forward, after which the table levels off and the containers come in contact with the moving conveyors. The table then tilts back to receive the next carton.

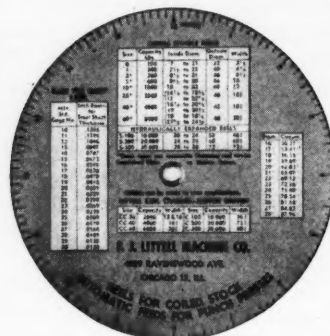
## NESTING TRAY—DOLLY COMBINATION

**NP5**—A combination of all-steel, welded tiering trays and a castored dolly to speed transfer of bread and other products from wrapping machines to delivery trucks is announced by the Coneco Engineering Co. The new tiering dolly combination is designed to protect packaged products against damage. The dolly is made from 1 1/2" x 1 1/2" x 3/8" angle iron of all-welded construction 32" x 21" x 5 1/8", and is equipped with four-in. semi-steel swivel roller bearing casters. The individual tiering trays, also of all-welded construction,

provide maximum strength for tiering to heights of 10 to 12 trays and higher. Tray frames are made of 5/8" x 5/8" x 1/8" angle iron. Both top and bottom frames are notched and formed from one piece of angle iron for maximum rigidity and strength.

## COIL WEIGHT CALCULATOR

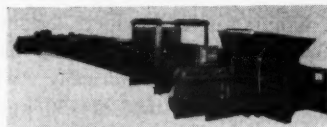
**NP6**—A new coil weight calculator has been devised by the F. J. Littell Machine Co. Its use is said to permit quick, easy calculation of the exact weight of steel coils. Inside and outside diameters are dialed to get lb. per in. of width. Unit weight is then dialed against the width of stock, and total weight of coil is



shown. On the back of the calculator is a sheet-gage table and a complete listing of all sizes of the company's reels. By using this calculator, the foreman can choose correct size of reel required for any size or weight of coil, and double check coil weights shown on bills of lading. One or more of these calculators will be sent free on request.

## SHUTTLE CONVEYOR

**NP7**—A new trough belt shuttle conveyor with a traveling plow is available from Trowbridge Conveyor Co. Features include flexibility of operation; maximum and uniform loading of



storage space; simple maintenance and increased capacity. This machine was designed for filling a series of long narrow bins in areas with low headroom. The unit pictured has an 18"-wide x 29'-long belt, troughed by special two-



# Pittsburgh CARGOTAINERS

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and Reduce  
Handling Costs**



*Above, CARGOTAINER being loaded into delivery truck at vendors holds 345 castings—more than 2700 lbs. Previously only 88 castings weighing 704 lbs. were handled in odd size drums by one man in the same amount of time. Uniform size of CARGOTAINERS allows easy stacking after castings are loaded—also affords more efficient handling from inspection through shipping.*



CARGOTAINERS in above photograph are received at assembly plant from vendor—are easily unloaded directly from truck to storage space. Note ease of stacking and minimum of storage space required, also the variety of parts that pack easily in CARGOTAINERS.

*At right, CARGOTAINERS again save additional handling time and costs at end of machining process on castings. Parts are easily packed back into CARGOTAINERS and moved to storage to await final assembly. The awkward gap between vendor and assembly plant is easily bridged with versatile, maneuverable CARGOTAINERS.*

For further information on Pittsburgh CARGOTAINERS, write Pittsburgh Steel Products Company, Department FO, Grant Building, Pittsburgh 30, Pa.



CARGOTAINERS illustrated are in operation at both Pittsburgh DuBois Division and Monessen Foundry Division, Rockwell Manufacturing Company.

## CARGOTAINERS by

**Pittsburgh Steel Products Company**  
Subsidiary of  
Pittsburgh Steel Company



**Economize and INCREASE PRODUCTION in your plant with the APPLICATION of Ultimate Light and Medium Duty Roller Bed Belt Conveyors.**

Let us give you the facts, proven by years of service, on how ISLAND CONVEYORS save manual labor and increase your production. Used by leading dairies, breweries, bottling plants, candy manufacturers and other plants.

BULLETIN PB-60-1A-1



Distributors in Principal Cities  
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LONG ISLAND CITY 1, N. Y.

WRITE TODAY FOR BULLETINS

**ISLAND EQUIPMENT CORP.**

BULLETIN PAS-1A-2



pulley, dust-sealed ball bearing troughing rollers. Automatic lifting of the plow when it reaches the head end of the conveyor allows the feed to pass over the head pulley. The plow can be pushed or moved by a hand crank all the way to the hopper, giving a discharge at any point from one end of the bin to the other.

#### PORTABLE DUMPER

NP8—New improvements have been added to the Cesco Dumper, manufactured by Colson Equipment & Supply Co. The unit is a portable elevator which lifts, up-ends and dumps 750-lb. loads at a rate of up to 100 loads per hour. This equipment is adjustable to



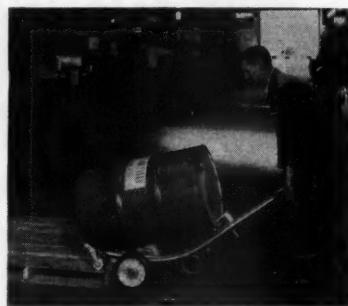
handle bags, drums, barrels and boxes. It is made in standard dumping heights of five, six, seven, eight, nine and 12 ft.; other models range in dumping heights up to 20 ft. According to the manufacturer, the dumper saves time, increases production and prevents accidents. It is equipped with such safety features as slack cable, safety switch, automatic stops at top and bottom, three-button control switch and solenoid operated brake on the  $\frac{1}{2}$  HP motor. The unit rolls from place to place on swivel casters and is equipped with two floor locks.

#### HALF-YARD SHOVEL CRANE

NP9—Model LS-51 is the newest addition to the line of shovel cranes manufactured by Link-Belt Speeder Corp. The  $\frac{1}{2}$ -yd. model is equipped with the company's Speed-o-Matic full hydraulic controls—formerly only available on machines with  $1\frac{1}{2}$  to three-yd. capacities. The LS-51 is convertible for operation as a shovel, trench hoe, lifting crane, dragline, clamshell or pile driver. Changing from one attachment to another is quickly accomplished with only slight changes in the machinery, it is announced. The hydraulic system is designed for faster operation, greater output, and lower maintenance cost. The front drum lagging used in dragline and other cable operations is interchangeable with a split sprocket used in connection with the Independent Positive Chain Crowd on shovel operations.

#### BARREL TRUCK

NP10—This one-man barrel truck, manufactured by the Roll-Rite Corp., offers the following features. Load



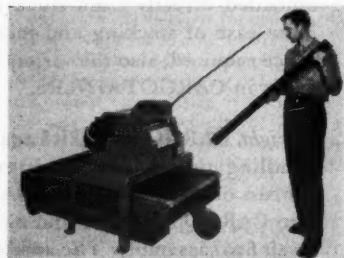
balanced; fully adjustable; rubber wheels; ball bearings; pallet charging; pallet discharging; safety design.

#### LINE MARKING MACHINE

NP11—The little Giant Handi-Liner, a new line marker, has been announced by Lasting Products Co. Constructed of electrically welded steel, the portable unit is said to be speedy and easily operated with one hand. According to the manufacturer, it makes straight, curved, continuous or skip lines and lettering. Visible paint flow eliminates paint waste and gives more lines per gallon, according to the manufacturer's release.

#### AUTOMATIC SCRAP CHOPPER

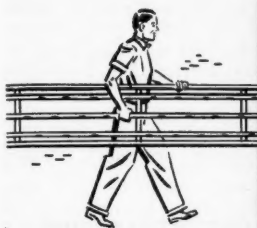
NP12—A new type automatic scrap chopper that produces uniformly cut  $1\frac{1}{2}$ " pieces especially suited for foundry use has been developed by Wenthe-Davidson Engineering Co. The exact amount of scrap that should be added to a heat can thus be weighed out and easily shoveled into the furnace or cupola. The  $1\frac{1}{2}$ " scrap lays solid



when melting. The chopper occupies only  $5\frac{1}{2}' \times 2\frac{1}{2}'$  of floor space. The removable cutting knife, of hardened tool steel, rotates at 72 RPM, and will cut for weeks and months without resharpening, according to the release. The rotating blade is designed with a  $1\frac{1}{2}"$  offset that automatically controls the length of pieces cut, producing 72 per minute. The unit is equipped with a welded steel hopper-type one-ton capacity floor truck, which is rolled under the machine to receive the scrap.

#### STACKING BOX

NP13—Designed for handling and storing medium loads is this stacking



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GIVES ECONOMICAL  
**MOVEMENT**  
TO PRODUCTION

**100% PORTABLE**

- sturdy
- flexible
- light weight
- adjustable

**ALVEY-FERGUSON PORTA-FLOW CONVEYORS**

Quickly moved to any spot, they help move products without unnecessary handling. Available in straight or curved sections and mounted on portable, adjustable supports. Superior in design and construction—your best portable conveyor buy!

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**A "NON-ELECTRIC" MAGNETIC  
SEPARATOR PULLEY GUARAN-  
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THE PERFORMANCE OF AN  
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SEPARATOR PULLEY**



IT'S TRUE... **ONLY HOMER HEAVY-DUTY** Permanent "non-electric" Magnetic Pulleys are guaranteed to equal or exceed the performance of electro magnetic pulleys of same size and capacity. **HOMER Heavy-Duty Pulleys** available in standard diameters from 12" to 30", with belt widths from 4" to 60". Write for descriptive data.



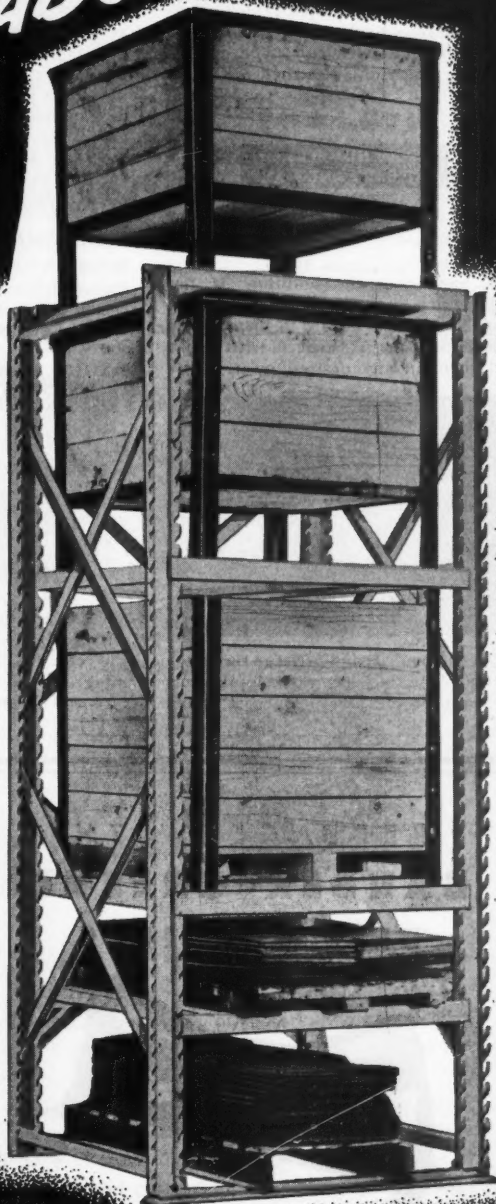
**The HOMER MANUFACTURING CO., Inc.**

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Producers of Magnetic Separator Equipment Since 1923

**TRULY  
ADJUSTABLE!**



This pallet rack is fully adjustable without the use of bolts or wrenches! Your fork lift truck can quickly and accurately position shelves to the proper spacing.

Racks can quickly be installed in banks of any desired length through the use of additional up-rights (standard height 9') bolted to either end of the rack section shown. This is the solution to your pallet storage problem. Write us for details.

**RACK ENGINEERING COMPANY**

925 LIBERTY AVENUE

PITTSBURGH 22, PENNSYLVANIA

box, available from Bay, Inc. It is available in sizes of 10" x 16" x 6" to 10" x 20" x 8" and is supplied in 16 and 18 gauge steel. Features include continuous stacking rim on all four sides; reinforced corners, spotwelded construction; four rivets for extra strength; drop handle at each end. The continuous stacking rim is designed for maximum rigidity when the boxes are stacked, it is said.

**CIRCLE NUMBERS ON THE CARD AND MAIL!**

#### THE TIPIT

**NP14**—Manning, Maxwell & Moore, Inc., Shaw-Box Crane and Hoist Division, announces the addition of the Tipit to its line. The purpose of this specialty item is to tip loads of any kind, after they have been lifted, and hold them in any desired position. It

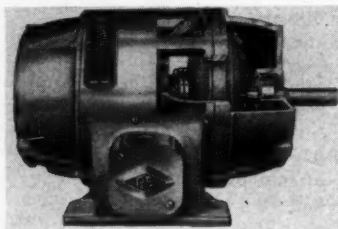


was developed particularly for the automotive trade, but has wide application for many of the jobs performed in in-

dustrial plants. The load is lifted by whatever means already in use, either chain block, electric hoist or small crane. The load is tipped to any desired position and held by turning the self-locking worm with a wrench which actuates a pocket wheel similar to that in a chain block. In the industrial field, the unit may be used for tipping baskets after they have been removed from degreasers to save a maximum of liquid; and for assembly and dismantling jobs where it is necessary to spot loads accurately in difficult places. The model has a capacity of 2000 lbs.

#### FLUID-SHAFT ELECTRIC MOTORS

**NP15**—A new development in electric motor design has been announced by the Reuland Electric Co. The units are called Fluid-Shaft motors and feature



a single frame, integral design of motor and fluid-drive coupling. According to the release, this is the first time that an integrally designed electric fluid-drive motor has been developed. The units

utilize regular Reuland electric motor frames and end bells. These motors offer many features wherever loads require smooth acceleration, protection from "jamming" and shocks, or are difficult to start. Typical of these installations are conveyors, extractors, bridge and trolley drives or cranes, winders and mixers.

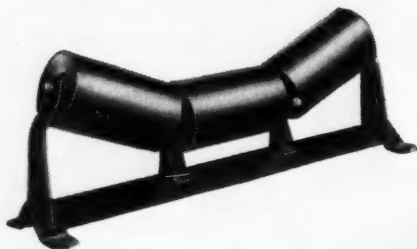
#### HOSE CUT-OFF MACHINE

**NP16**—Aeroquip Corp., manufacturers of flexible hose lines and self-sealing couplings, has announced a hose cut-off machine. Compact, and constructed to occupy a minimum amount of space, the equipment is designed to cut a hose quickly and accurately to the desired length. All types of flexible hose may be cut, including hose reinforced with plies of wire braid. This machine will accommodate sizes up to 3" OD, cutting hose at 90 degrees (square) in relation to the axis of the hose, without frayed ends.

#### DIESEL LOCOMOTIVE CRANE

**NP17**—A diesel locomotive crane designed especially for lighter work is available from the American Hoist and Derrick Co. The 10-ton unit is known as the American Model 410. It offers moderate first cost, and efficient, economical operation, according to the company. It is powered by an electric-starting diesel engine developing 72 HP at 1600 RPM and has a rated capacity

### REPLACE WITH BARBER-GREENE BELT CARRIERS

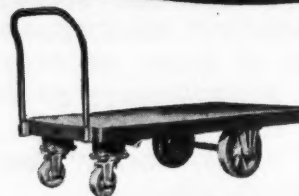


Many hard-used belt conveyors are causing excessive belt wear, consuming unnecessary power and are otherwise a source of trouble due to worn-out belt carriers. Now is the time to check yours and, at small cost, replace with new Timken or ball bearing-equipped Barber-Greene Carriers. A full range of sizes and types immediately available, featuring all-welded construction, interchangeable rollers with internal grease reservoir in each roller. See your B-G distributor or write:

**Barber-Greene Company**  
Aurora, Illinois

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takes half the "push"



**SERVICE SMOOTH-ROLLING  
"PUSH-E-Z" FLOOR TRUCK**



"PULL-E-Z" Truck differs only in running gear from the extra-busky, cost-cutting "PUSH-E-Z".

\*Fully loaded, PUSH-E-Z starts and rolls twice as easy as an average hand truck... as proved by tests. Platform of 10-gauge steel electrically welded to 3-in. rolled channel frame. Famous FORGEWELD casters. Casters and wheels roll on Hyatt roller bearings. Capacity to 6000 lbs. Prompt delivery. Write for specifications.

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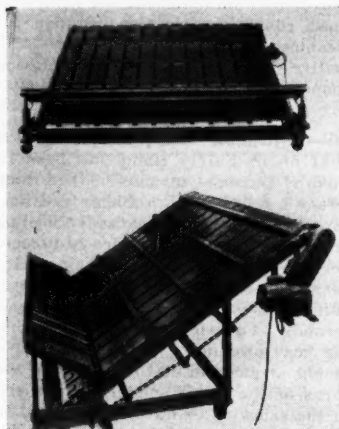
See Your Classified Telephone Directory For Nearest Distributor



of 20,000 lb. with a 40-ft. boom at 12-ft. radius. It is equipped with a full-vision cab, tandem band air-controlled clutches, and will perform all operations simultaneously. The machinery deck is compactly arranged with all units easily accessible. The three-speed selective transmission allows shifting from one speed to another while the crane is in motion. Travel speeds in the respective ratios are 2.25 MPH, 8.0 MPH, and 15 MPH; drawbar pulls are 8160 lbs., 2060 lbs., and 950 lbs. The model has a 7500-lb. single line hoist pull at 235 FPM. Slowing speed is 2.5 RPM.

### STRIPVEYOR

**NP18**—The Fried Steel Equipment Mfg. Corp. has developed a take-away unit for use with shears. Known as the Stripveyor, the equipment handles any width strip up to the widest allowable by a standard 24-in. back-gauge, carrying all material beyond the frame of the shear and into a receptacle. This includes any gauge sheet steel up to  $\frac{3}{16}$  in. For installation, the Stripveyor is adjusted for height, with back-gauge in low position, and plugged into an electrical outlet. The unit employs chain

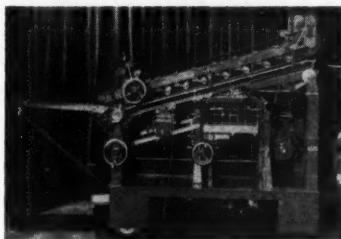


links with intermittent pusherlugs to which horizontal angles are attached. Round steel fingers grapple from the angles to below the table deck, pushing the material in front of them. Material does not pile up on the deck, since the speed of the take-away unit is synchronized with the speed of the shear. The table deck is fully adjustable up and down and the pickup chute is adjustable in all directions. Additional units manufactured by the company are designed to stack material coming from the Stripveyor. Quick manual manipulation of the stacking unit makes it possible to form several columns of material. For additional information, use the postcard bound into this issue.

### LABELING MACHINE

**NP19**—Chisholm-Ryder Co. has introduced a new labeling machine. Designed on the principle that unscrambling, labeling, easing and sealing operations must be progressively on lower

levels, the CRCO-New Way Model E Labeling Machine introduces a new straight through elevating principle in labeling. The unit labels the contain-



ers as they are elevated and discharges them at a point 12 or more ins. higher

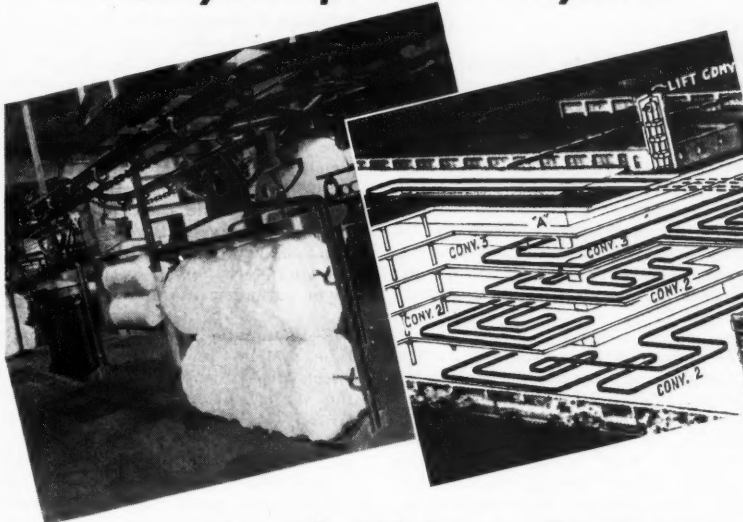
than at the feed end. This development facilitates a straight gravity flow from closing machines to case sealers. The Model E is fully adjustable for containers from  $1\frac{1}{2}$ " to  $5\frac{1}{8}$ " in diameter by  $1\frac{3}{4}$ " to 7" in height.

### Better, Bigger Directory

New, improved features will be incorporated in the 1949-1950 FLOW Directory. More definitions and sketches; revisions for easier and more complete reference. Copies are \$5.00 each.

## EFFICIENT HANDLING

### For your present layout



### ... and with Minimum Expense

Eliminate high handling costs and irregular material flow with MHS Monoveyor . . . the most inexpensive, the easiest to install, and the easiest to relocate of any type of conveyor.

Monoveyor is a highly flexible monorail conveyor that will direct materials to and from your machines and processes in their present locations. You don't have to move anything; Monoveyor operates in unused ceiling area . . . around corners, between floors and through walls. It is tailored to your needs and can be installed in your whole plant or in any department to reduce your handling costs.

Let our engineers show you the simplest, the quickest, and most economical way to reduce handling, decrease work in process inventory and as a result lower the unit cost of your product. Free bulletin gives full details. Yours for the asking.

*All types of modern handling equipment—complete engineering service on materials handling problems.*

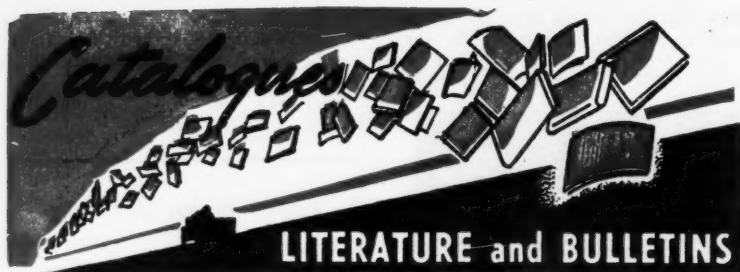


**MECHANICAL HANDLING SYSTEMS, INC.**

*Manufacturing Engineers*

4620 NANCY AVENUE • DETROIT 12, MICHIGAN

*Offices in Principal U.S.A. Cities*



The publications featured on these pages were written by experts. They are FREE publications. To obtain these use the postcard bound into this issue.

**25—Protective Padding . . .** A new swatch book offered by Kimberly-Clark Corp. contains samples of six specifications of protective padding, which are available for immediate shipment. These padding materials represent the most popular lines of Kimpak used for interior cushioning in packaging, including padding, filtration and protective linings.

**26—Flexible Chain Couplings . . .** Morse Chain Co., Division of Borg-Warner Corp., is offering a new 16-page booklet on its flexible chain couplings. Subjects covered are: roller chain stock couplings; silent chain stock couplings; heavy duty, made-to-order silent chain couplings; and steel and plastic covers for the two stock couplings. Information is given on dimensions, horsepower ratings and stock and maximum bores, with numerous illustrations.

**27—Industrial Locomotives . . .** The latest issue of General Electric's publication "Industrial Locomotives" is devoted entirely to diesel-electric locomotives in the paper and lumber industries. Case studies give the cost savings obtained through the introduction of the engines. Each study is accompanied with on-the-scene pictures. Twenty-five, 45 and 65-ton units are discussed.

**28—Truck Batteries . . .** The Gould Storage Battery Corp. is offering a new Battery Selector Bulletin—GB-1055—to guide purchasing agents, plant engineers, material handling supervisors, and battery-room foremen in selecting correct batteries for industrial trucks. The two-color, eight-page publication announces the new "Z" plate and describes its construction and operating features. Included is an exploded view showing each component of the company's "Thirty" and "Kathanode" batteries, with explanatory text which discusses each element in detail. The bulletin concludes with two pages of engineering specifications and operating data for almost 100 batteries of different sizes and capacities.

**29—Fork Trucks . . .** The Towmotor Corp. has published another of its on-the-spot job studies, which emphasize the economy obtained in material handling through the use of lift trucks and tractors. The new literature, No.

84 in the series, deals with the Clinton, Iowa, plant of Curtis Co., Inc., manufacturer of door sashes, interior trim, moulding and panel work. It describes the material handling problem as it existed and how it was solved.

**30—Conveyors . . .** The Alvey-Ferguson Co. has issued a 32-page catalog illustrating and describing its line of apron, belt, live roller and vertical conveyors. Approximately one-half of the literature is devoted to application photos showing the company's units in many plants performing a variety of tasks. The units are pictured carrying lightweight objects, such as small bottles and cans, also heavier materials such as rolls of newsprint, truck chassis and refrigerator cabinets. Several pages contain engineering drawings and text covering such topics as typical conveyor arrangements and accessories.

**31—Pneumatic Tubes . . .** Pneumatic tube systems for communication between departments and buildings are the subject of a brochure from the Grover Co. The units are designed to save time, error, cut costs and maintain order. The literature describes how a tube system ties together under one control such plant facilities as sales, maintenance, tool design, shipping, purchasing, inspection, assembly, etc. In addition, the tubes can handle samples, small parts and the like. The brochure is profusely illustrated.

**32—Portable Belt Conveyor . . .** A catalog sheet by Speedways Conveyors, Inc. on its new reversible, portable endless belt conveyor. The unit is available in three models. Length of the belt ranges from 10' to 15'; height of conveyor in horizontal position, 33" to 58" (two models are equipped with hydraulic lift as extra equipment). Speed of the belt is 50' per minute; capacity with live load in horizontal position, 50 lb.; with live load at 30 degree angle, 300 lb. Photos and specifications are included.

**33—Adhesives . . .** The story of adhesive products is presented in a six-page two-color illustrated pamphlet by Paisley Products Inc. The literature describes the large variety of adhesive raw materials and chemicals now being employed to meet the specialized production requirements of all industries. Ten basic divisions are given in detail,

and a product list shows end uses and industries served. Fully illustrated.

**34—Industrial Wheels . . .** The City Machine and Wheel Co. has issued a pamphlet on its new line of wide-base Speedwheels. The wheel is manufactured in eight, 10, 12 and 14 in. sizes and comes equipped with General wide-base tires and tubes. Features of the units include precision assembly of tire on wheel; strength for safety; a wide range of bearing types and sizes; special hubs of the customer's design, if desired. The literature includes specifications for 12" and 14" pneumatic tire and tube wheels and 12" and 14" pneumatic tires and tubes. Numerous photos and line drawings of applications.

**35—Flight Conveyors . . .** A richly illustrated, informative catalog is available from Hapman Conveyors, Inc. Its 36 pages feature photos of complete models, components as well as application views of Hapman rubber flight conveyors. Several dozen engineering drawings depict layouts and applications. Insets show details of discharge and loading points, turns and special accessories. Proper installation methods are described. In addition to their use for conveying bulk materials and abrasives, these conveyors are also installed for cleaning sludge tanks, feeding locomotive stokers, and for removing coolants.

**36—Adjustable Ramp . . .** Bulletin 4971 on its Safety Ramp has been issued by Barrett-Cravens Co. The ramp offers a solution to problems and hazards which can cause excessive loading and unloading time, injuries to personnel and damage to goods. The portable ramp is adjustable in height to provide a gradual incline in a matter of seconds. A mechanical screw-type lifting gear provides a 12-in. variation in height at one end of the ramp. A few turns of the crank will bring that end of the ramp up or down as required to line up and rest securely on the end of the truck or the dock. The wheels of the ramp may be retracted by cranking to clear the ground. This allows the ramp to move vertically with the truck bed if springs and tires deflect under heavy loading thus keeping the ramp and truck bed aligned. Numerous photographs, line drawings, specifications and operating data are given.

**37—Scales . . .** The Yale and Towne Mfg. Co. has announced new literature on its Little King Bench Scale line. The bulletin, number P1159, enumerates functions for which the scale is designed, for example receiving, shipping, compounding, batching, packaging and testing. Specific industries which use the Bench Scale include bakeries, laundries, chemical plants, post offices, etc. Illustrations show industrial applications. Features of the line include outboard bearing construction which is said to prevent platform tilt and eliminate excessive wear on pivots and bearings; and magnetrol mechanism which

# OPPORTUNITIES

*Men wanted Jobs wanted Lines available*

Rates: for "Positions Wanted" \$4.00 minimum, limit 25 words. For all other classifications \$4.50 minimum for 25 words, each additional word 15c; boldface type or all capitals, \$7.50 minimum for 25 words, each additional word 20c; limit 50 words. Box address count as five words. All insertions are payable in advance. These classified columns are not intended for the advertising of new products by manufacturers, their representatives, or their distributors. These columns are limited to Help Wanted or Positions Wanted advertisements, and for the offering of used equipment by the users of such equipment.

## REPRESENTATIVES WANTED

**REPRESENTATIVES WANTED:** Manufacturer of overhead cranes, monorails, etc., wants representatives in certain New York, Minnesota, Michigan, Pennsylvania, Indiana and Middle Western territories. Write giving details your organization and previous experience in the field, if any. Box 10149.

provides accuracy in heavy-duty service. Other features described include the full-float platform lever system; moistureproof dial head; swivel dial head which can be turned 360 degrees; positive locking mechanism; and large clear graduations. Engineering drawings and tables are included.

**38—Pneumatic Conveyors . . .** "The Airveyor", a pneumatic conveyor, is pictured and described in Bulletin A-15, released by Fuller Co. The unit is designed for unloading, conveying and reclaiming dry pulverized, crushed and granular materials. Each page contains several photos and/or engineering drawings and explanatory text. Topics covered include typical "Airveyor" installations; types of materials conveyed; industrial applications; withdrawing and conveying from various sources, and transfer trucks and transfer units for unloading ships. One page contains data required for preliminary study.

**39—Power Conveyors . . .** A brochure is available from the Bean-Cutler Division of the Food Machinery Corporation. It describes and illustrates its line of power conveyors showing various applications to different production operations.

**40—"One Wheel Shay" . . .** The Shallow Co. has issued a catalog sheet showing two of its all steel barrows. Both models are pictured together with specifications and important features.

## EQUIPMENT WANTED

### WANTED

Fork Lift Trucks      Krane Kars  
Hand Lift Trucks      Skid Platforms  
Pallets      Conveyors

We pay high prices for  
Used Handling Equipment

A & A MACHINERY CORP.  
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### WANTED

WOOD PALLETES  
Used, in Good CONDITION  
large quantity preferred  
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Brooklyn, N.Y.  
Hyacinth 7-3331

## POSITIONS WANTED

### INDUSTRIAL SALES EXECUTIVE

Broad experience in selling and administration includes building a national industrial dealer organization. Particularly qualified in material handling and related lines. Middle forties, good health, college graduate. Now employed. Looking for permanent connection with opportunity to use full capabilities. Available on reasonable notice. Box 10249.

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**DISTRICT SALES MANAGER.** Experienced in sale of SCREW CONVEYORS, ELEVATORS, and POWER TRANSMISSION EQUIPMENT. Openings in CHICAGO, KANSAS CITY, and ST. LOUIS warehouses. Must be well qualified. Salary, expenses, and commission. Write complete details on experience and salary requirements.

FT. WORTH STEEL & MACHY.  
FT. WORTH, TEXAS

## INFORMATION WANTED

### WANTED TO BUY A MAILING LIST

of companies now using

### ELECTRIC INDUSTRIAL TRUCKS

This list can consist of companies in either this country or abroad.  
Box 753, 1474 Broadway, N.Y.C.

## FOR SALE

**FOR SALE.** 1 Model KW-7-54 Hydro-electric truck made by Lift Truck, Inc., Capacity 4000#. Equipped with 4 rubber tires and 10 cell, 12 volt Edison battery. Platform width 23 3/4", length 54", height lowered 7" with 3 1/2" lift. #803 Baldor charger included. Equipment is two years old and is in A-1 condition. Available for inspection. Simplicity Pattern Company, Inc., Niles, Michigan.

## FOR SALE

At Stockton, Calif. Two fork trucks less than year old.

**AUTOMATIC BF-40.** Capacity 4000 lb. @ 36 in. Overall height 83 in. Max. telescopic lift 130 in.

**Yale & Towne K41-3M.** Capacity 3000 lb. @ 48 in. Overall height 83 in. Max. telescopic lift 119 in.

Both equipped with battery, guard and charger. Price for both, including one spare battery \$13,500. May be purchased separately.

LUDLOW MFG. & SALES CO.  
P. O. Box 1993  
Boston 5, Mass.

## Hardwood Pallets

32"x40" (USED) 70c EA.  
SACRIFICE  
Excellent Condition—Costs less than an expendable Pallet—Worth more than twice as much.  
F.O.B. Binghamton, N. Y., New Cumberland, Pa., Alexandria, Va.

**Wood Pallet Company, Inc.**  
332 E. 149th St., New York 22, N.Y. ME 2-54161  
419 Boylston St., Boston 26, Mass. KE 9-8638

**FOR SALE.** LT60 Towmotor hydraulic fork lift truck. Continental gasoline engine, 6000 lb. capacity, pneumatic tires, new. Driven total 6 hours. Available for inspection any day Monday through Saturday, 9 a.m. to 4 p.m. McGean Chemical Co., 2910 Harvard Ave., Cleveland, Ohio, Vulcan 3-9292.

**CAR SPOTTER SALE:** Electric Car Puller Hoists complete with Timken Tapered roller bearings, bronze work gear, sturdy steel base, vertical capstan; totally enclosed ballbearing motor. (3 phase, 60 cycle, 220-or-440-volts—other currents available). Speed approximately 40-ft. per minute. \*Model 5-BB (5HP) 5000 lbs. starting pull—\$388; \*Model 7-BB (7 1/2 HP) 7000 lbs. starting pull—\$488; \*Model 10-B (10HP) 10,000 lbs. starting pull—\$587. Bernstein Brothers, Manufacturers-Distributors, "Since 1890" Pueblo, Colorado.

## TRUCKMAN LIFT TRUCK

Model D—Good Used Condition  
Selling price, \$325.00  
John Bean Division  
1305 S. Cedar St., Lansing, Michigan

**PALLETS, 1,000 Two Side 66" x 42"** Hard Wood. Excellent Condition. Exceptional value. Harvey Sales Company, 301 East 152nd Street, Harvey, Ill. Harvey 555.



# Double Trouble?

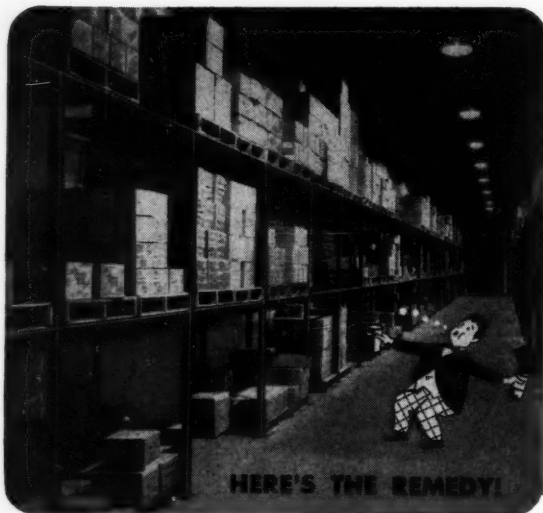


## PROBLEM A:

*How to stack uneven and fragile palletized loads.*

## PROBLEM B:

*How to stack mixed loads without tying up low-level material.*



## Prefabricated! Pallet Racks

For every type industry. Stack palletized loads to the ceiling, safely, with these rugged, all-welded tubular steel racks. Easy to erect and move. Adjustable underclearance for varying height loads. No welding or cutting necessary.



Write for  
catalog

**EQUIPMENT  
MFG. INC.**  
21552 HOOVER, DETROIT 5, MICH.

## Literature Available From Advertisers In This Issue

(Check corresponding numbers on the enclosed card for the free literature listed below.)

**A-1. BARRETT-CRAVENS CO.** The Barrett Junior Catalog, fully illustrated with photos, is available upon request.

**A-2. LINK-BELT SPEEDER CORP.** Book No. 2503 gives suggestions on material handling with Link-Belt Speeder shovel cranes.

**A-3. MOBILIFT CORP.** will send you an illustrated folder on the operation of its fork trucks.

**A-4. TRUSCON STEEL CO.** offers descriptive literature on its complete line of steel skids and skid boxes.

**A-5. WAYNE PUMP CO.** A folder contains information on Wayne Industrial Hoists and hydraulic lifting units.

**A-6. FACTORY SERVICE CO.** The Turner System Book describes the system and units developed by the company.

**A-7. THE MOTO-TRUC CO.** will send bulletin No. 49 on its line of motorized, battery operated walkie trucks.

**A-8. CLARK EQUIPMENT CO.** The latest issue of Material Handling News contains case studies of the company's fork trucks and tractors.

**A-9. COLSON EQUIPMENT & SUPPLY CO.** An eight-page illustrated folder shows various uses for the Cesco Dumper.

**A-10. ACME STEEL CO.** "Savings in Shipping" gives information on steel strapping applications.

**A-11. BERGER MFG. CO.** will send literature on its line of "wedge-lock" steel shelving.

**A-12. CHISHOLM-MOORE HOIST CORP.** CM Meteor and Comet hoist features are described in a new catalog.

**A-13. MONARCH RUBBER CO.** is offering literature on the application of Monarch solid tires to various industrial trucks.

**A-14. EUCLID CRANE & HOIST CO.** Literature is offered containing information and photos on the company's traveling bridge cranes.

**A-15. STEEL PARTS MFG. CO.** offers information engineering data and specifications on its Steel-Belt Conveyors.

**A-16. ADDISON-SEMME CORP.** Illustrated data on the company's "Power-Pack" expendable pallet are available.

**A-17. PRODUCTION ACCESSORIES CO.** "Is Somebody Swiping Your Profits?" is the title of a folder describing collapsible storage and shipping boxes.

**A-18. E. W. BUSCHMAN CO.** Bulletin 40 gives details on standard stock units for trolley conveyors.

**A-19. ALLIS-CHALMERS** is offering literature detailing its Tracto-Shovel in conjunction with various attachments.

**A-20. PITTSBURGH STEEL PRODUCTS CO.** Cargo-tainers are the subject of literature offered by the company.

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*A New Era  
IN LUMBER SERVICE*



### PALLETS

#### HEAVY CRATES — LARGE BOXES WOOD PARTS — PACKAGED LUMBER PALLET REPLACEMENT PARTS

#### STERLING INDUSTRIAL LUMBER FABRICATION

means the lumber products you buy are engineered and manufactured "ready-for-use," to do a particular job.

To meet the requirements of industrial lumber consumers, we have developed facilities in Chicago, Illinois and Goodwater, Alabama; staffed with lumber specialists and engineers capable of solving your lumber problems.

Carload shipments of Industrial Lumber, packaged or box-car loaded and LCL Pallets are other STERLING services to industry.

Write Dept. F10 for our brochure,  
"A New Era in Lumber Service."

**Sterling LUMBER & SUPPLY COMPANY**  
11900 So. Halsted Street  
Chicago 28, Illinois  
PU lman 5-0220



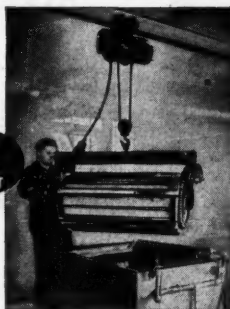
"Recovered 3 TIMES Its Cost  
in 2 YEARS Use . . .  
No Repairs or Replacements"

THE  
**Titan**  
ELECTRIC HOIST

\*Unsolicited statement made by  
a Michigan User, about a Titan  
Hoist.

The Titan is a powerful little  
hoist built with Big hoist features  
including Cone Worm Drive,  
Electric Brake, and Steel Wire  
Hoisting Rope.

\*You can get profits in the same  
way with Titan Hoists handling  
things in your plant.



Handling material through  
the air saves floor space  
for production.

Ask For  
**BULLETIN 801A**

on the Titan Hoist,  
also Bulletin 695  
on light overhead  
cranes.

THE DETROIT **Titan** ELECTRIC HOIST  
manufactured by  
**DETROIT HOIST & MACHINE CO.**  
200 Morrow St. Detroit 11, Mich.

## UNITABLE PORTABLE BELT CONVEYORS

### HIGHLY ADAPTABLE TO YOUR NEEDS

The UNITABLE fits a wide variety of production,  
assembly, inspection and packing operations. It  
can be lengthened or shortened and moved  
easily from one location to another. Working  
space can be increased by adding side leaves.  
Belt speeds are fixed or variable—3 feet  
(minimum) to 80 feet (maximum) per minute.



**CONVEYOR  
SPECIALTY  
COMPANY  
INC.**

36 Newport Ave.  
North Quincy 71  
Mass.

Write today for our complete catalog on  
Gravity Roller, Belt and Chain Conveyors.

*Palmer Shile*

## DESIGNS and BUILDS

all types of Trucks, Skids, Pallets, Platforms, Racks, Boxes, Bins, Tables for Pick-up, Loading, Moving, Shipping, Dumping and Storage.

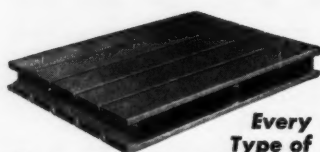


Item No. D-28  
Item No. C-451

### Sloped Bottom

#### BOX and STAND

for simplified handling of small parts, economically. BOX (D-28) is of all-steel construction equipped with stacking brackets. Hand lever releases parts that slide down to waist high tray on stand for easy disposal of seated or standing operator. Can be furnished with crane lugs, for platform trucks and fork trucks. STAND (C451) heavy-duty all-steel reinforced construction.



Every  
Type of

#### All-Steel PALLET

Single or double faced. Any size and capacity.



Item No.  
B-727

### All Metal

#### PALLET RACK and Nesting Ring

Single face pallet rack with stacking corners. Nesting ring can be furnished permanently welded to pallet. Special rolled channel steel — all welded construction. (We build all sizes.)

# MATERIALS HANDLING EQUIPMENT

*Designed to do Specific jobs Better*



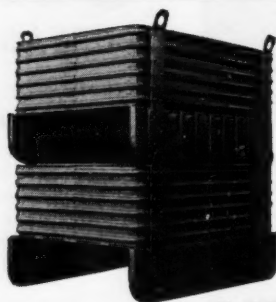
Item No. C-467

## Corrugated Steel STACKING BOX

A heavy duty corrugated all-steel welded stacking box with corrugated bottom. Built with a four way entrance. Crane lugs, stacking brackets are optional. Boxes are built to required specifications, including underneath clearance. Load capacity and color of paint desired, may also be specified.

### When Ordering:

always give "Item" number; this will help prevent error.



Item No. B-528

### Corrugated Steel PLATFORM BOX

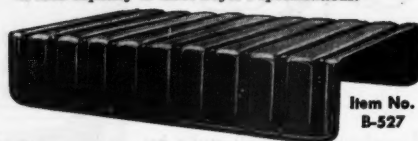
Heavy-duty all-steel construction. Can be tiered to any height. Easy to handle by lift truck. Built to any size. Specify dimensions, including underneath clearance, load capacity, quantity, and paint if desired. Also whether crane lugs, stacking brackets and channel runners are required.



Item No. B-746

### Corrugated BOX WITH LEGS

Ideal for moving or storing heavy metal parts; built of heavy corrugated steel; reinforced throughout with angle iron. Legs are designed to permit complete accessibility with fork or power lift truck. Made in any size or load capacity to meet buyer's specifications.



Item No.  
B-527

### Corrugated STEEL PLATFORM

Sturdy heavy-gauge all-steel, built to withstand unusual load strain. Cold pressed from sheet of formed corrugated steel. Knee braces and bumper channel runners can be furnished. Use with any type lift truck. Custom built—when ordering give required dimensions, including underneath clearance.

DESIGNED AND MANUFACTURED BY

*Palmer Shile Co.*

16012 Fullerton Avenue, DETROIT 27, MICHIGAN

849



*take your pick  
of*

**PERFORMANCE**



Oliver 740 Industrial



Oliver 770 Industrial



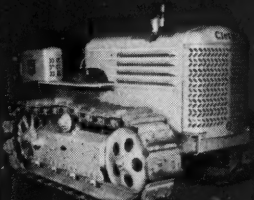
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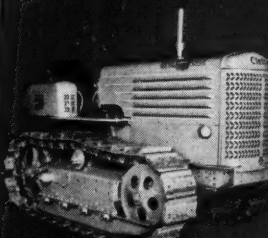
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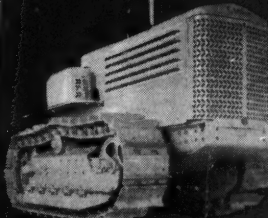
Oliver Cletrac Model H3



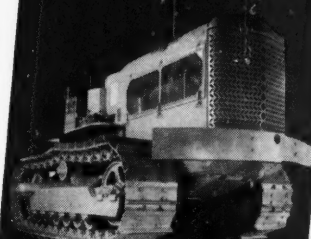
Oliver Cletrac Model A



Oliver Cletrac Model B



Oliver Cletrac Model D



Oliver Cletrac Model F

● From the complete line of Oliver "Cletrac" Crawler Tractors and Oliver Industrial Wheel Tractors you can pick exactly the tractor you need and be assured of performance *in advance.*

The finest in industrial machinery is more than a slogan to Oliver . . . it is an accomplished fact that has been proved in year after year of outstanding performance. Design, materials, workmanship, and plant equipment are all based on one standard . . . the built-in dependability that adds up to more years of service in the field . . . lower operating and maintenance costs to you.

Combine this unsurpassed dependability with the *extra* service offered by your Oliver "Cletrac" Distributor . . . a complete line of industrial crawler and wheel tractors . . . a full line of allied equipment . . . complete service facilities and adequate stocks of genuine Oliver "Cletrac" repair parts . . . plus a broad background of field experience . . . and you'll see why you can take your pick of performance.

"THE SIGN OF  
EXTRA SERVICE"



**Cletrac**

a product of

**The OLIVER Corporation**

Industrial Division, 19300 Euclid Avenue, Cleveland 17, Ohio

**A Complete Line of Crawler and Industrial Wheel Tractors**

**DISTRIBUTORS in 56 Trading Areas  
MORE THAN 26,000  
READER-BUYERS**

**TO  
REACH THE BUYERS  
USE . . . .**

# THE "C.B.P." Plan

**FOR**

- ✓ *Authenticated Readers*
- ✓ *Complete Market Coverage*
- ✓ *Lowered Sales Costs*
- ✓ *Greater Sales Volume*

## **THE WHY! WHAT! and HOW! of C. B. P.**

Currently FLOW has over 26,000 readers. FLOW reaches more than just "people"—or "names"—or "positions"—it reaches BUYERS. In addition to the C C A QUANTITY guarantee of circulation, FLOW now gives the advertiser an added quality value through the C B P (Certified Buying Power) plan. The plan was established after carefully selecting 46 outstanding material handling equipment distributors located in key marketing areas throughout the nation.

### **EACH DISTRIBUTOR—A FLOW CIRCULATION MANAGER**

Each distributor subscribes for his active and most important ma-

terial handling equipment customers, and for his best prospects. The distributor pays us \$1.44 per year per subscription. These constitute an "identifiable" readership composed of authenticated, known buyers and users . . . the distributors being the authenticating agents! Thus—under "C B P"—Readers and Buyers become synonymous and interchangeable terms . . . whether you—as the manufacturer—sell direct or through distributors—FLOW guarantees CERTIFIED BUYING POWER. These 26,000 reader-buyers comprise the known national market for material handling equipment and, therefore, are the people to whom you must tell your story. Here is "CERTIFIED BUYING POWER"—around which you can most profitably build your sales and merchandising campaign.

# Flow MAGAZINE

1240 ONTARIO STREET CLEVELAND 13, OHIO